Developing Effective Military Leaders: Facilitating the Acquisition of Experience-Based Tacit Knowledge

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April 2005

20050627 082

**United States Army Research Institute
for the Behavioral and Social Sciences**

**U.S. Army Research Institute
for the Behavioral and Social Sciences**

**A Directorate of the Department of the Army
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Research accomplished under contract
for the Department of the Army

Yale University

Technical Review by

David P. Costanza, The George Washington University
Joseph Psotka, U.S. Army Research Institute

NOTICES

REPORT DOCUMENTATION PAGE

1. REPORT DATE (DD-MM-YYYY) April 2005	2. REPORT TYPE Final	3. DATES COVERED (From - To) September 2000 - September 2004

4. TITLE AND SUBTITLE Developing effective military leaders: Facilitating the acquisition of experience-based tacit knowledge	5a. CONTRACT NUMBER DASW01-00-K-0014
	5b. PROGRAM ELEMENT NUMBER 611102

6. AUTHOR(S) Cynthia T. Matthew, Anne T. Cianciolo, and Robert J. Sternberg	5c. PROJECT NUMBER B74F
	5d. TASK NUMBER 1904
	5e. WORK UNIT NUMBER

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Yale University 155 Whitney Avenue, Room 214 New Haven, CT 06520-8337	8. PERFORMING ORGANIZATION REPORT NUMBER

9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES) U. S. Army Research Institute for the Behavioral and Social Sciences 2511 Jefferson Davis Highway Arlington, VA 22202-3926	10. MONITOR'S ACRONYM(S) ARI
	11. MONITOR'S REPORT NUMBER(S) Technical Report 1161

12. DISTRIBUTION / AVAILABILITY STATEMENT

Approved for public release; distribution is unlimited.

13. SUPPLEMENTARY NOTES
Subject Matter POC: Cynthia T. Matthew; Contracting Officer's Representative: Paul A. Gade

14. ABSTRACT

    This investigation tested methods derived from Sternberg's theory of practical intelligence (Sternberg et. al, 2000) that were designed to enhance experience-based (tacit) knowledge in military leadership. Two experimental studies were conducted that built on prior research. The first research effort was a quasi-experiment, in which 101 Army officers participated in theory-based reflection interventions or a no-reflection control. Results showed a strong effect of reflection condition on tacit knowledge post-test scores ($F (3, 91) = 3.743$, $p = .01$). In the second experiment, 235 college students participated in a theory-based reflection intervention or reflection control. Results showed a marginally significant effect of reflection condition on tacit knowledge post-test performance (Hotellings $T (1, 233) = .015$, $p = .06$). This investigation suggests that individual reflection interventions based on cognitive theory may promote experiential learning as measured by domain-specific, practical problem-solving.

15. SUBJECT TERMS
Experiential learning   reflection   tacit knowledge

SECURITY CLASSIFICATION OF:			19. LIMITATION OF ABSTRACT	20. NUMBER OF PAGES	21. RESPONSIBLE PERSON Ellen Kinzer Technical Publication Specialist 703-602-8047
16. REPORT Unclassified	17. ABSTRACT Unclassified	18. THIS PAGE Unclassified	Unclassified		

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2O161102B74F	and Training

The mission of the U. S. Army Research Institute for the Behavioral and Social Sciences (ARI) is to maximize individual and unit performance and readiness to meet the full range of world-wide Army missions through advances in the behavioral and social sciences. This investigation illuminates a previously unexplored aspect of Sternberg's theory of intelligence by outlining the cognitive processes involved in acquiring tacit knowledge from experience, the problem solving skills involved in solving complex practical problems, and the interaction between knowledge and problem solving in expert performance. The reflection methods and case study assessments developed for this investigation can be used for further research in this area of inquiry. The reflection methods developed in this project can be directly applied to leadership development in the Army at multiple levels of leadership. A manual of materials was created for this purpose and the methods featured in the manual can also be adapted to specific training situations. The next step will be to verify that the methods in the manual work in actual training/leader development applications.

MICHELLE SAMS
Technical Director

Acknowledgment

DEVELOPING EFFECTIVE MILITARY LEADERS: FACILITATING THE ACQUISITION OF EXPERIENCE-BASED, TACIT KNOWLEGE

EXECUTIVE SUMMARY

Research Requirement:

To develop and test methods to enhance practical problem solving skills and the ability to acquire experience-based (tacit) knowledge for purposes of application to leadership development and deepening knowledge of underlying cognitive processes.

Procedure:

Two related experimental studies were conducted to investigate the effect of theory-based reflection methods on practical problem solving in Army officer and college student samples using domain-specific and context-dependent measures to assess tacit knowledge in each sample. Two new case study scenario assessments were developed for each sample. Three theory-based reflection methods were designed according to the theory of practical intelligence. In a single three-hour session, participants were administered self-paced tacit knowledge pre-test assessments, covariate measures, an experimental reflection method or control condition, and tacit knowledge post-test assessments. Statistical analyses were conducted to test the effect of each experimental reflection method on tacit knowledge post-test performance.

Findings:

The skills underlying the acquisition of tacit knowledge can be taught. Reflection methods derived from the theory of practical intelligence effectively promoted practical problem solving in research participants. Theory-based reflection appears to be more effective than simple practice, as substantiated by the military leadership research (Research Effort 1), and certain types of reflection methods are more effective than others in promoting tacit knowledge acquisition. In the college life research (Research Effort 2), an analytic reflection control that prompted participants to examine and analyze domain-specific issues was less effective than a reflection method derived from the theory of practical intelligence.

Utilization of Findings:

This investigation showed that even very brief reflection methods based on the theory of practical intelligence can improve practical problem solving. However, all reflection methods are not alike. The effectiveness of a particular reflection method seems to depend upon the complexity of the task. The reflection methods and case study scenarios developed for this investigation can be directly applied for purposes of ongoing research and/or leadership development.

DEVELOPING EFFECTIVE MILITARY LEADERS: FACILITATING THE ACQUISITION
OF EXPERIENCE-BASED, TACIT KNOWLEDGE

CONTENTS

LIST OF TABLES

LIST OF FIGURES

Developing Effective Military Leaders:
Facilitating the Acquisition of Experience-Based, Tacit Knowledge

INTRODUCTION

The work environment of the future Army leader is characterized by an increased diversity in the nature of missions, a greater requirement for rapid, widely dispersed deployment, and a wider array of sophisticated technology—all of which require that officers more effectively and efficiently learn from experience. Research suggests that experience-based (tacit) knowledge is a critical component of success in military leadership (Horvath et al, 1999) and private sector management (Wagner & Sternberg, 1991). A variety of reflection methods have been used to enhance or foster the exchange of tacit knowledge in a range of workplace settings (Argyris, 1994, 1999; Epstein, 1999; Watkins & Marsick, 1993). However, there appears to be limited empirical work to support the claim that experience-based learning can be facilitated by reflection on experience. Moreover, if reflection does indeed enhance one's capacity to learn effectively from experience, it is unclear what types of reflection methods may be most effective. These questions were addressed in two field experiments, which tested the effect of reflection methods derived from Sternberg's theory of practical intelligence (Sternberg et al., 2000) on practical problem solving in Army officers and college students.

Prior research suggests that people differ in their ability to learn from experience (McCall, Lombardo, & Morrison, 1988; Sternberg, et al., 2000; Wagner & Sternberg, 1991) and that acquired knowledge or skill is a product of the interaction between person and experience. Drawing from Sternberg's (1985, 1997) theory of intelligence, which differentiates practical from analytical and creative abilities, the practical ability to acquire tacit knowledge and thereby learn from experience (i.e., practical intelligence) is itself a form of developing expertise. When previously acquired tacit knowledge is applied through action in response to new experience, the action tests the implications of that tacit knowledge. The information provided by the outcome may modify or complexify the cognitive network of domain-specific tacit knowledge. According to the theory, the ability to learn from experience develops into practical expertise through an iterative process of acquiring tacit knowledge, applying it to new situations, and developing the knowledge structure as a result of the outcome of actions taken in the context of experience. In this way, abilities are conceptualized as malleable processes as opposed to fixed traits.

Reflection methods were developed based on Sternberg's theoretical conceptualization of the structure of tacit knowledge and processes involved in developing it. Hypotheses and predictions were advanced consistent with Sternberg's theory, in which practical intelligence is conceptualized as a form of developing expertise through a process of tacit knowledge acquisition, application, and development.

tacit knowledge in military leadership. According to Sternberg's theory of practical intelligence, tacit knowledge is defined as a complex set of condition–action statements that are domain specific, and reflect "knowing how" versus "knowing that."
Tacit knowledge plays a key role in practical problem-solving and effective action (Sternberg et al., 2000). When practical problems are complex or ambiguous, such as those faced by military leaders in the current environment, practical skills and a flexible knowledge base are required to know when and how to take quick and effective action (Schön, 1983; Smith, Ford, & Kozlowski, 1997). Facilitating the acquisition of tacit knowledge improves upon an officer's capacity to effectively isolate variables in the environment that are relevant to a particular problem, select actions that will lead to appropriate solutions, and implement these actions effectively (Schön, 1983; Tolman & Brunswik, 1935). As tacit knowledge is a critical component of practical intelligence, we expected to show that facilitating the acquisition of tacit knowledge would, in turn, improve practical problem solving. Improved practical problem solving has obvious implications for leadership effectiveness in the complex, rapidly changing environment of modern military service.

Two complementary approaches to understanding tacit knowledge that have been explored in the literature were integrated to develop reflection methods for this research. The first approach, originated by Polanyi (1966) and examined more extensively by Sternberg and his colleagues (e.g., Sternberg & Wagner, 1992; Sternberg et al., 2000; Wagner, 1987; Wagner & Sternberg, 1991), is characterized by an information-processing explanation for how knowledge that is not easily articulated enhances performance. Efforts to facilitate the acquisition of tacit knowledge using this approach have targeted individuals' ability to identify the appropriate environmental conditions on which to act (e.g., Sternberg, Wagner, & Okagaki, 1993). The second approach, originated by Schön (1983), focuses on developing tacit knowledge through personal reflection on the causal loop in which tacit knowledge, actions based on this knowledge, and consequences of the action taken, are situated. According to Schön (1983), action— which links tacit knowledge to action outcomes—and reflection—which links action outcomes to tacit knowledge—serve as the cornerstones of tacit knowledge development.

Antonakis et al. (2001) incorporated both of these approaches in a model of tacit knowledge acquisition within the framework of Sternberg's theory of practical intelligence and tacit knowledge. This model illustrates the dynamic interaction of condition and action aspects in the development of tacit knowledge. Sternberg's theoretical treatment, which specifies cognitive and metacognitive processes involved in tacit knowledge acquisition and development, served as the basis for designing experimental reflection methods to enhance experience-based learning and to make predictions about their relative effectiveness. In this way, we attempted to determine the aspects of tacit knowledge on which attempts to facilitate such knowledge should focus in order to maximize both efficiency and effectiveness.

In particular, three types of reflection methods were developed that draw attention to: 1) factors considered in problem identification (reflection on condition); 2) chosen action and action outcomes (reflection on action); and 3) a combination of both reflection

2

In particular, three types of reflection methods were developed that draw attention to: 1) factors considered in problem identification (reflection on condition); 2) chosen action and action outcomes (reflection on action); and 3) a combination of both reflection on condition and action. To measure the differential effect of these interventions on practical problem solving, two new military-specific case study instruments were developed to assess practical skills and tacit knowledge in military leadership. It was predicted that reflection methods that focus reflection on both the condition and action aspects of practical problem solving would improve scores on tacit knowledge measures more than methods that focus on one or the other aspect exclusively. It was also expected that reflection methods that focus reflection on both the condition and action aspect of practical problem solving would be superior to traditional analytical methods of reflection (e.g., assessing the advantages and disadvantages of a particular action in a given situation).

Two studies were conducted to assess the relative effectiveness of experimental training interventions. The first effort involved the development of materials specific to the leadership in the U.S. Army and was administered to Army officers; these materials were designed to assess officers in multiple ranks and levels of command. However, this research effort was interrupted by the deployment of officers to the Iraq War. Therefore, we designed a second research effort that was adapted for administration to a sample of college students. It involved developing new measures of tacit knowledge in college life and adapting existing measures and interventions accordingly. To assist the Army, the reflection methods and case study instruments have been compiled in the form of a supplemental training manual that can be applied to a leadership development curriculum.

BACKGROUND

Inquiry into the nature and processes involved in learning from experience has been pursued by scholars from a wide range of disciplines including: learning theory (Dewey, 1938; Kolb, 1984), philosophy (Polanyi, 1966), psychology (Reber, 1989; Reber & Lewis, 1977; Sternberg et al., 2000; Wagner & Sternberg, 1985), and management (Nonaka & Takeuchi, 1995). Polanyi (1966) first proposed the importance of the ability to implicitly acquire tacit knowledge from experience and the critical role of attention. Neisser (1976) first made the distinction between practical intelligence as it pertains to learning from experience and intelligence associated with academic success.

Broadly speaking, the investigation of tacit knowledge and its role in performance has been approached from two complementary perspectives. The first perspective stems from Polanyi's (1966) recognition of individuals' ability to implicitly acquire an understanding of the connection between a pattern of stimuli or events and an experience. This is illustrated by an example of a blind man identifying objects with a cane to show how patterns of stimulation to the hand that occur when the cane touches an object become tacitly understood as the presence of the object itself. He noted that the man using the cane would likely be unable to articulate how he "knows" there is an object at

3

Furthering Polanyi's (1966) discussion of tacit knowledge, Sternberg and his colleagues (e.g., Sternberg & Wagner, 1992; Wagner, 1987; Wagner & Sternberg, 1991) developed and tested a theory of tacit knowledge and practical intelligence, a component of Sternberg's broader theory of successful intelligence (Sternberg, 1985, 1997). The theory of successful intelligence recognizes the importance of analytical, creative, and practical abilities in the successful accomplishment of personally valued goals within a particular socio-cultural context. Investigations of tacit knowledge and practical intelligence based on this theory have explored cognitive information processes that occur when an individual acts on tacit knowledge in a particular situation. As discussed in more detail in the next section, Sternberg and his colleagues have described tacit knowledge as a complex set of condition–action mappings through which individuals select and execute the appropriate action (e.g., turning to avoid a wall) given specific environmental conditions (e.g., stimulation to the hand holding the cane). Extensive research has been devoted to outlining the nature and content of tacit knowledge, specifically the identification of the particular conditions to which action must be mapped in order to achieve desired action outcomes, as it is the condition calling for action that is the most difficult to articulate (see Sternberg et al., 2000, for a comprehensive review). Sternberg's theory regarding tacit knowledge and practical intelligence has led to the development of occupation-specific (e.g., management, military leadership) tacit knowledge measures, in which individuals must select actions to solve practical problems based on their sensitivity to the environmental conditions in which the problems are situated.

The second perspective through which tacit knowledge has been explored springs from Schön's (1983) work, in which action is recognized as an important factor that shapes the contents of an individual's tacit knowledge base. Schön's emphasizes the role of action in shaping the content of tacit knowledge and unexpected action outcomes in leading an individual to reflect on tacit knowledge, or assumptions that led to the action. He examined different types of thought processes demonstrated by professionals, in particular those used to address novel problems in day-to-day work experience. Schön found that when customary responses prove ineffective, professionals engage in a natural form of reflection on-the-spot to try out and consider new action, which he calls reflection-in-action. This he distinguishes from reflection-on-action, which occurs retrospectively. Rather than specifying the precise conditions that give rise to particular actions, Schön's work and that of several other investigators in the area of experience-based learning (e.g., Argyris, 1988; Epstein, 1999; Mezirow, 1991; Raelin, 1997) focuses on the hypothesis-testing process through which individuals come to develop or modify the tacit knowledge network through this process. Though time-consuming, reflection methods characteristic of this approach have been successfully used to enhance the performance of private sector managers (Argyris, 1994, 1999) and medical personnel (Epstein, 1999).

These two approaches to understanding tacit knowledge differ in that the first approach, taken by Sternberg and his colleagues, focuses primarily on the content of tacit knowledge—the conditions giving rise to action—while the second approach, characterized by Schön's work, focuses on the process of acquiring tacit knowledge—the

actions that are linked to particular conditions and how action outcomes inform the development of tacit knowledge. Using Polanyi's example of the blind man, Sternberg's approach focuses on the cognitive processes through which a pattern of stimulation to the hand gives rise to interpreting the experience of an object and the action that should be taken. In contrast, Schön's approach focuses on how action, based on the expectation that a specific pattern of stimulation to the hand will result in a specific outcome, is tested. If an undesired action outcome results, reflection on the expectations that led to the action may serve to enhance the tacit knowledge that gave rise to the expectation. The two approaches are complementary in that both appear to describe parts of the same whole. That is, although it is critical that an individual recognize the environmental conditions indicating particular actions to take in a given situation, the individual must also recognize how that information relates to particular action outcomes and how reflecting on this relationship leads to enhanced tacit knowledge.

Acquiring Tacit Knowledge

Polanyi (1966) noted that a critical factor contributing to implicit, rather than explicit, acquisition of knowledge is the direction of attention away from the particular stimuli or events that give rise to an experience and toward the internal sensations stimulated by them. For example, people often report experiencing "butterflies in their stomach" when a potential romantic partner responds positively to a gesture of interest. Attention here is focused away from external cues such as the potential partner's body language and toward the internal or visceral experience precipitated by the positive response. Further, if determinations of interest level are correct and a romantic involvement ensues, when asked, "How did you know she/he was interested?" a typical response might be, "I don't know—I just got the right vibe," rather than recognizing the specific cues or conditions on which their intuition was based.

In order to improve such determinations and resulting actions, however, attention must be directed back to the particular body language that individuals used as cues for action. Working primarily in the domain of complex problem solving, Sternberg and his colleagues (Horvath et al., 1999; Sternberg et al., 2000; Sternberg & Wagner, 1992) have taken an information-processing approach to describe the relationship between the particular stimuli or events that give rise to action and the action itself. They describe tacit knowledge as a complex set of condition–action mappings through which individuals select and execute the appropriate action given specific environmental conditions.

Sternberg and his colleagues characterize tacit knowledge as having three critical features. First, tacit knowledge is acquired through a process that is individual and personal. That is, tacit knowledge is acquired with little explicit support from sources external to the learner, such as conventional classroom curricula. Second, tacit knowledge contains information regarding the appropriate responses to particular situations. This knowledge could be associated with understanding in a particular situation the consequence of one's own actions or those of other involved parties. This feature

illuminates the action or procedural orientation of tacit knowledge as opposed to simply fact or declarative orientation. Third, tacit knowledge is applicable to the accomplishment of personally valued goals. Goals that are unrelated to an individual's success typically do not lead to the acquisition of an extensive body of tacit knowledge, as the attention required for learning is devoted elsewhere.

Though tacit knowledge tends to be difficult to articulate verbally, it is demonstrated by an individual's general capacity to solve problems of a practical nature (Sternberg et al., 2000). That is, tacit knowledge plays a key role in practical intelligence—the ability to adapt to, select, and shape environments in order to solve everyday problems. According to the theory, tacit knowledge is applied to experience through cognition at two-levels of abstraction. The first is a higher-order problem solving process, which engages certain executive functions called metacomponents that include: problem identification, resource allocation, representation and organization of information, formulation of solutions, monitoring of solutions, and evaluation of solution outcomes. The second is a lower-order set of cognitive processes called performance components, through which action is executed (e.g., analogic reasoning, induction, and inference.)

Based on the recognition that tacit knowledge cannot be directly measured, one of the ways it has been measured has been through its application to the solution of practical problems. Described in detail in Sternberg et al. (2000), the process of generating and selecting problems to be used in the assessments is geared toward developing problems that tap knowledge having the characteristics described above. Studies conducted by Sternberg and his colleagues (see Sternberg et al., 2000 for a summary) indicate that results of assessments of tacit knowledge are related to the performance of military leaders and that results of such assessments explain leadership effectiveness above and beyond frequently used measures of general cognitive ability. Thus, by facilitating the acquisition of tacit knowledge, the metacognitive skills for practical problem solving may be more effectively used and performance—the demonstration of practical intelligence— consequently enhanced.

Sternberg and his colleagues (Sternberg et al., 2000; Sternberg & Wagner, 1992; Wagner & Sternberg, 1991) further describe three cognitive processes that underlie the acquisition of tacit knowledge: selective encoding, selective combination, and selective comparison of information. These processes interact to reduce and organization the vast amount of information in any given situation. Selective encoding involves extracting information that is relevant to personally valued goals. Through selective combination this encoded information is integrated to form a meaningful pattern. This new pattern of information is compared relative to previously acquired tacit knowledge by the process of selective comparison.

Tacit knowledge that is adaptive should enhance the metacognitive skills used in practical problem solving. Thus, by increasing the effectiveness of selective encoding, combination, and comparison of information, the acquisition of tacit knowledge may be facilitated and practical problem solving improved. Described in more detail later,

6

Sternberg, Okagaki, and Jackson (1990) and Sternberg, Wagner, and Okagaki (1993) have investigated with some success the effectiveness of training interventions targeting these cognitive processes.

Through extensive qualitative research in the domain of military leadership, researchers found that tacit knowledge in military leadership could be divided into three broad categories: intrapersonal tacit knowledge (managing self), interpersonal tacit knowledge (managing others), and organizational tacit knowledge (solving organizational problems). Within each category, the relevance of a particular aspect of tacit knowledge was appropriately related to the rank of the military leader and reflected the shift in job demands across ranks (Donnithorne, 1993; Horvath, et al,. 1996, 1998, 1999). For example, tacit knowledge about managing oneself (e.g., temper control, time management) has been reported by military personnel as particularly relevant to the job demands of military leadership for lieutenants, captains, or lieutenant colonels. In contrast, interpersonal tacit knowledge regarding the development of subordinates was shown to be primarily relevant to the jobs of captains in their verbal reports. The patterns of the relevance of tacit knowledge across ranks reflect the shift in job demands—from motivating subordinates using immediate, face-to-face leadership to fostering the future of the Army through personnel development and vision—which occurs as military leaders are promoted (Donnithorne, 1993). They also may indicate the psychological development of military leaders as they progress upward in rank.

In summary, it appears that one path to facilitating the acquisition of tacit knowledge in military leaders may be through the development of more effective cognitive processes that selectively encode, combine, and compare information present in the occupational environment (for more see Sternberg et al., 1990, 1993). Through the reduction and organization of information, the acquisition of tacit knowledge would influence the effectiveness and flexibility of the metacognitive skills used to solve practical problems in occupational environments, thus enhancing practical intelligence and development of expertise.

Facilitating Tacit Knowledge

Reflection on Condition
By outlining the cognitive information processes underlying tacit knowledge and practical intelligence, the theory described above suggests the characteristics that efforts to develop tacit knowledge acquisition should share. That is, such efforts should involve the environmental context in which tacit knowledge is situated and yet should provide the individual with a somewhat more general facility to acquire tacit knowledge from experience. In the interests of developing a teaching strategy for improving the ability with which students adapt to, select, and shape their environments, Sternberg (1998) presented twelve principles for translating his theory of successful intelligence into specific instructional methods for schoolteachers. These principles provide an example of an instructional method geared toward facilitating tacit knowledge acquisition in a particular environment while simultaneously suggesting general methods for learning from experience. Although practical intelligence represents but a component of the theory

of successful intelligence, which also describes the critical contribution of analytical and creative intelligence to the adaptation to, selection of, and shaping of environments, we focus here on practical intelligence, as it appears to be especially relevant to military leadership. A subset of the twelve principles related to practical intelligence that inform the development of experimental reflection methods in this research is described below.

Principle 1. <u>The goal of instruction is the creation of expertise through a well- and flexibly organized, easily retrievable knowledge base.</u>

To accomplish this goal, instruction should facilitate the process through which tacit knowledge cognitive structures become less ambiguous and increasingly context-specific. As the unaided acquisition of tacit knowledge occurs through experience in actual occupational environments, the facilitation of tacit knowledge acquisition in an experimental setting should provide insight into how such acquisition occurs to maximize its effectiveness and relevance (Horvath et al., 1999). Experimental reflection methods that make tacit knowledge explicit and available for conscious evaluation and development should be transferable as a learning strategy that military leaders can use adaptively in the field. Therefore, ideally the experimental reflection methods should be techniques for enhancing tacit knowledge and practical intelligence in the field both during peacetime and in combat.

Principle 2. <u>Instruction and assessment should involve utilization, at various times, of all six metacomponents of the problem-solving cycle.</u>

Facilitation of tacit knowledge acquisition is stimulated by both the recognition of relevant information and associated actions that when applied to real-world situations result in effective problem solving. This process involves the previously specified six metacognitive skills (problem identification, resource allocation, the representation and organization of information, strategy formulation, monitoring of problem-solving strategies, and evaluation of problem solutions). Because tacit knowledge cannot be directly measured, these metacomponents can form the basis for assessing as well as developing tacit knowledge and practical problem solving.

3. <u>Instruction should involve utilization, at various times, of at least three knowledge-acquisition components, including (a) selective encoding, (b) selective comparison, and (c) selective combination.</u>

Findings described in Sternberg et al. (1993) suggest that targeting the cognitive processes underlying tacit knowledge acquisition (i.e., selective encoding, combination, and comparison) is critical for enhancing performance. In this research, groups of students who received training in knowledge-acquisition components were compared to groups of students who did not receive training. Trainees who received cues for selective encoding or selective comparison targeted more relevant information, missed fewer relevant pieces of information, and labeled fewer pieces of irrelevant information as relevant than did the control groups.

4. <u>Instruction should help students (a) adapt to, (b) shape, and (c) select environments.</u>

As described previously, the primary function of tacit knowledge and practical intelligence is to aid the individual in adapting to, shaping, and selecting environments that are practical in nature (e.g., resolving a conflict at work, performing well on the job, etc.). With practice metacognitive skills can be developed and improve upon problem solving through conscious attention to problem identification, resource allocation, representation and organization of information, formulation of solutions, monitoring of solutions, and evaluation of solution outcomes. The ultimate goal of methods designed to development practical problem solving skills should be relevant to the long-term development of expertise—an adaptive and flexible overall capacity to effectively relate to the practical world (e.g., see Smith, Ford, & Kozlowski, 1997). Such a relationship would allow military leaders to better adapt to environments to which they are initially ill-suited, to select environments that allow them to capitalize on their strengths and compensate for their weaknesses, and to shape environments that would maximize both their learning and performance outcomes.

Reflection on Action

Past work shows the often-remarkable ability that individuals have to demonstrate effective knowledge without awareness (Schön, 1983). However, it also shows that tacitly held beliefs are frequently maladaptive (e.g., Argyris, 1988). Instead of attempting to characterize the nature and content of effective tacit knowledge, several investigators (Argyris, 1988; Epstein, 1999; McCall et al., 1988) have sought to investigate the effects of maladaptive tacit knowledge and the processes through which this knowledge is updated or changed. Agreeing that the ability to learn from experience is critical to job success, investigators taking this approach have devoted a great deal of research to developing models of on-the-job learning and to facilitating the acquisition of tacit knowledge in occupational environments (e.g., McCall et al., 1988; Myers & Davids, 1993; Nonaka, 1994; Raelin, 1997; Schön, 1983; Smith et al., 1997). Like the work of Sternberg and his colleagues, the work of these researchers emphasizes the importance of developing a flexible, adaptive body of knowledge that can be applied to problem solving in occupational environments in which the problems are complex and ill defined. The findings from research and practice using this approach suggest that personal reflection guided by expert knowledge is critical for improving what is learned from experience—a practice used for instructing cadets in military leadership at West Point (McNally, Gerras, & Bullis, 1996).

Broadly defined, reflective practice is the use of introspection, typically initiated by unexpected action outcomes, to determine the relationship between tacitly held theories regarding the meaning of conditions, the relevance of actions and the related outcomes of those actions (Aryris, 1999; Epstein, 1999; Mezirow, 1991; Raelin, 1997). Ideally, reflection is integrated with action so that "reflection-in-action" occurs when to modify knowledge structure and respond in ways that are more adaptive in a particular situation (Schön, 1983). However, Schön (1983) noted that the timeline defining action

might range in length from just a few seconds (e.g., kicking a field goal) to several months (e.g., preparing a legal case) to even an entire career. He also observed that the shorter action timelines are less likely to benefit from reflection than the longer ones, as there is more opportunity for reflection to interrupt the action process. Reflection, however, may also occur after an action has been taken. Indeed, several reflective methods described in the literature involve introspection on actions already taken rather than introspection during the course of action (Epstein, 1999; Raelin, 1997). Still, the goal of such methods is to facilitate learners' ability to reflect in real time.

The utility of reflective methods in organizations is apparent when one notes that articles or book chapters describing such methods are typically found in publications geared toward practitioners (Epstein, 1999; Osterman & Kottkamp, 1993; Raelin, 1997, Wegner & Snyder, 2000) and discuss the use on reflection in the field (e.g., Argyris, 1999; McCall et al., 1988; McNally et al., 1996). However, the effects of reflection on occupational effectiveness are not fully known and there are diverse points of view regarding its usefulness with regard to identifying and changing behavior (e.g., Mezirow, 1991; Nisbett & Wilson, 1977; Nonaka, 1994; Schön, 1983). Further, theory regarding the processes through which reflective practice has its influence is diverse. Nevertheless, there do appear to be some common threads that tie this body of work together. One common theme identified as the basis of effective reflection is a process of hypothesis testing (Mezirow, 1991). Many scholars agree that critical steps to updating knowledge and improving performance include developing ideas about the rationale for proceeding with a particular course of action, following up on those ideas by actually taking action, and then reflecting on the results (Argyris, 1999; Epstein, 1999; Schön, 1983).

While various reflection methods have been proposed in the literature (e.g., Argyris, 1999; Epstein, 1999; McNally et al., 1996; Raelin, 1997), there is general agreement on how these methods facilitate learning from experience, which can be reflected in performance outcomes. These points of agreement served as a springboard from which three principles were derived for developing the reflection methods designed for this investigation.

Principle 1. Reflection methods must direct attention to the precise condition-action relations that lead to the outcome of that action relative to some known standard.

As noted previously, hypothesis testing—or testing of the tacitly held condition–action propositions—is critical to effective reflection and facilitating knowledge acquisition (Mezirow, 1991; Schön, 1983), as does the interpretation of the meaning of the conditions – a form of knowledge representation. . Reflection on action and its consequences facilitates learning by requiring the learner to assess the accuracies of his interpretations of the meanings of the condition, its appropriate categorization and elaboration relative to some known standard. The standard may reflect either personally or culturally valued behavioral goals. This alerts the learner to the possibility that there are tacit influences on decision-making (e.g., Argyris, 1988, 1999; Schön, 1983) and tacit

beliefs or assumptions regarding the condition–action relationships in the environment that can ultimately limit action outcomes (Schön, 1983; Tolman & Brunswik, 1935).

Principle 2. <u>Reflection methods must direct attention to the tacit condition–action and action-outcome propositions that gave rise to the action taken.</u>

Awareness of the fundamental link between tacitly held condition–action and action–outcome relationships is a critical step in improving decision-making and the primary goal of reflective practice (Argyris, 1988; Schön, 1983). Reflection increases awareness through a process of examining tacitly held beliefs associated with the problem situation in which an expected outcome did not follow a chosen course of action. By considering alternative assumptions that might account for the unexpected outcome, a new understanding of condition–action relationships in the situation is developed. Based on this new understanding, alternative courses of action can be considered and tested in practice to confirm its validity (Epstein, 1999; Schön, 1983).

Principle 3. <u>Initially, reflective practice should be guided by feedback, preferably that of an interested expert, so that newly developed condition–action propositions are less likely to be maladaptive.</u>

People may benefit differentially from reflective practice, depending on how adept they are at identifying the relevant condition–action contingencies (Nisbett & Bellows, 1977; Wilson & Nisbett, 1978). Expert feedback, which has been associated with the development of expertise (McNally et al., 1996), may be effective because it directs attention appropriately. This implies that methods that focus reflection on the appropriate condition–action contingencies have the potential to reduce individual differences associated with reflective practice.

CONCEPTUAL FRAMEWORK

As stated previously, the two approaches to understanding tacit knowledge presented above are complementary. Further, their corresponding implications for facilitating tacit knowledge acquisition, the principles derived from the theory, can be integrated into a comprehensive framework for understanding the role that both the condition and action aspects of tacit knowledge play in practically intelligent performance. Reproduced and slightly modified on the next page in Figure 1 is a theoretical framework presented in Antonakis, Hedlund, Pretz, and Sternberg (2001) that illustrates how these approaches fit together. Elements in the shaded portion of the figure represent the tenets of Sternberg's theory regarding practical intelligence and the role that tacit knowledge plays in the demonstration of practical thinking. Non-shaded elements represent the tenets of Schön's theory regarding the role of action and reflection in reorganizing tacit knowledge. The condition and action aspects of tacit knowledge and practical problem solving are represented in the top and bottom halves of the figure.

New Experience

Past Experience...1

Past Experience... k

Selective encoding

Selective comparison

Selective combination

Knowledge acquisition

Metacomponents: plan, monitor, evaluate problem-solving process

Condition

Action

Abstraction. Formation of general principles, frameworks, and causal relations

Performance components

Integration of old TK to form new TK

→ = antecedent condition

--▶ = feedback loop

●==➤ = activation process

Reflection on action and outcome

Outcome

Take action (test hypothesis)

Figure 1. Model of practical intelligence and tacit knowledge acquisition

Illustrating Sternberg's work, the framework draws clear links between the cognitive processes underlying knowledge acquisition and the role that knowledge acquisition plays in supporting the cognitive metacomponents engaged in practical problem solving. Performance components are involved in the execution of decisions made by an individual. Activation of the performance components leads to a particular action, which leads to an outcome.

Illustrating Schön's work, the action taken provides a test, the outcome of which will either serve to support existing condition–action propositions held by the individual or to challenge them. The connection between reflection on action outcomes and tacit knowledge is shown to occur in two possible ways. First, shown in the middle of the figure, when expected action outcomes occur, the tacitly held condition–action

propositions are supported. If action outcomes do not occur as expected, this connection represents the adjustment of action or application of tacit knowledge.

The second connection between reflection and action outcomes, shown on the lower left-hand side of the figure, indicates the path of re-integration of knowledge and reformulation of condition–action propositions that occurs when unexpected outcomes occur as a result of action. This connection occurs when the individual must reframe the problem. Together, the top and bottom halves of the figure clearly indicate the potential benefit of focusing on the condition aspects of tacit knowledge, the action aspects of tacit knowledge, or both, when attempting to facilitate tacit knowledge acquisition.

Based on this model, reflection methods utilized in this investigation target the condition aspect, action aspect, and a combined approach. The differential effects of these methods were examined. Further, the combined approach was explored relative to traditional methods of analytical reflection typically employed in academic settings.

TACIT KNOWLEDGE MEASURES AND REFLECTION METHODS

Tacit Knowledge Measures

In general, two types of situational-judgment testing formats have been developed to assess practical problem solving and domain-specific tacit knowledge. Tacit knowledge inventories feature a series of brief vignettes, each of which present a domain-specific problem situation and provides a set of solution alternatives, which are rated for quality on a Likert scale. Case study scenarios present more extended problem situations that simulate the contextual complexity of real-world situations by including multiple issues, previous actions taken, and some relevant information needed to understand and solve a complex problem. They consist of a detailed description of the particulars of a problem situation as it unfolds over time, followed by a set of open-ended questions designed to assess knowledge-acquisition components and practical problem-solving skills, two important aspects of behaving in a practically intelligent way (Sternberg, 1988). This method of assessing tacit knowledge draws from approaches commonly used in managerial assessment and education, including in-basket tests, which require prioritizing and responding to job-relevant materials (e.g., memos and reports) in a limited amount of time, and case studies, which involve critiquing and/or solving a detailed case description. Tacit knowledge vignettes and case study scenarios are derived from subject matter experts and are designed to represent realistic practical problems that might be encountered in a particular domain.

Two new platoon-level military scenarios and two new college life scenarios were developed for this investigation to measure practical problem-solving skills and domain-specific tacit knowledge. Procedures employed to develop and score each type of scenario are described below.

Military Scenarios

To develop military scenarios, interview data and corresponding coded tacit knowledge analyses previously obtained from interviews with Army officers to develop the Platoon-Level Tacit Knowledge for Military Leaders (TKML) Inventory (Hedlund et al., 1999) were reanalyzed to create two new tacit knowledge scenarios. First, two of the problem themes inherent in these data (e.g., difficulties with a Sergeant First Class) were selected to provide a contextual framework for the new scenarios. Next, specific tacit knowledge condition–action statements relevant to each theme were incorporated into scenario content (e.g., when a Soldier is promoted without an increase in rank, it can be difficult to establish authority). To enrich scenario context, pertinent information was extracted from Army leadership doctrine, training materials, and standard operating procedures (Frame & Lussier, 1999; U.S. Department of the Army, 1994a, 1994b, 1998a, 1998b, 1999a, 1999b, 1999c, 1999d, 2001, 2002).

Completed scenario drafts were reviewed by two senior Army officers who served as subject matter experts (SMEs), and were revised accordingly. The revised scenarios were piloted with a group of 20 senior non-commissioned and three commissioned officers in the 1st Battalion, 1st Infantry Regiment at West Point. Open-ended questions designed to measure practical problem solving and tacit knowledge were included in the scenarios. These questions were developed consistent with the principles of assessment and measurement such that each question 1) was a single question, rather than compound question, 2) was worded using Army terminology, rather than technical psychological terminology, and 3) was designed to be easy to read, rather than using complex phrasing. The new military tacit knowledge scenarios with accompanying questions are presented in the Appendix A.

To assess the practical problem-solving skills and tacit knowledge content in the military scenarios, two comprehensive analytic scoring rubrics were developed to score responses to questions in each new scenario. An analytic approach to scoring emphasizes a more quantitative, point-by-point rating scale that focuses on the presence or absence of specific elements in the participant's response (Mertler, C.A., 2001). In this case scores were assigned based on the extent to which responses demonstrated appropriate tacit knowledge content and relevant metacognitive processes (i.e., condition-action–outcome linkages). Regarding tacit knowledge content, responses were evaluated by comparisons with relevant tacit knowledge content previously obtained through research from Army experts. Regarding metacognitive processing, responses were evaluated in terms of properties associated with problem identification, selected course of action, anticipated action outcomes, and obstacles. For example, problem identification was scored based on evaluation of immediate vs. long-term time perspective, relative importance of problem identified, and complexity of the knowledge network reflected by cause and effect linkages identified. The selected course of action was scored based on evaluation of the complexity of the procedural knowledge reflected by causal linkages to identified problems and strategies for action. Anticipated action outcomes and obstacles were scored based on evaluation of the specificity of condition-action linkages and level of

abstraction and insight. Scoring rubrics for new military scenarios are displayed in the Appendix B.

College Life Scenarios

To develop college life scenarios, interview data were collected from upperclassmen serving as residence hall advisors, who were considered "subject matter experts" in college life because of their experience and demonstrated ability to succeed in college (details of the procedures can be found in the Appendix C). Interviewees were asked to talk about a problem faced in college in which they learned an important lesson about how to succeed in some aspect of college life. They were encouraged to describe the problem situation in detail, how they handled it, and what they would have done differently in hindsight.

College life scenarios were developed based on common themes and dilemmas that emerged from the interviews with college life experts. Two context-rich, complex, and ambiguous scenarios were created to elicit variability in problem identification and solution generation. The first scenario features multiple problems associated with performance in an upper-level English class. The second scenario depicts a situation in which a roommate exhibits a disruptive pattern of behavior and declining performance in school. Open-ended questions designed to measure practical problem solving and tacit knowledge were incorporated into the scenario. Scenario drafts were piloted with a group of upperclassmen who considered the scenario independently, responded to open-ended questions, and then participated in a focus group discussion to assess content and questions. Scenarios were revised accordingly. College life scenarios with accompanying questions are displayed in the Appendix D.

To assess the practical problem-solving skills and tacit knowledge content in the college life scenarios, two comprehensive scoring rubrics were developed that integrated aspects of analytic and holistic approaches to scoring. This revised approach was undertaken because it improved time efficiency without detracting from quality. Responses to scenario questions were rated holistically on a five-point scale by recent college graduates (i.e., experts) based on two dimensions: 1) tacit knowledge content, and 2) complexity of thought or understanding of cause and effect. Scoring rubrics for new college life scenarios are displayed in the Appendix E.

Reflection Methods

For the military research effort, three reflection methods were developed to test the relative effect of reflection that focus on different aspects of practical problem solving based on the previous discussion. Each method was designed to examine thinking associated with practical problem solving in response to one of the tacit knowledge vignettes, a case study scenario, and a practical problem that the respondent had dealt with in their own life. Each intervention began with a description of the particular strategy for reflection. The *condition-focused method* facilitated reflection on problem identification and goal formulation associated with a tacit knowledge vignette. It included

15

questions that uncovered factors considered and probed underlying assumptions associated with problem definition and solution goals. For example, "Describe the factors you considered when choosing your goal and determining the problem that must be solved (e.g., doctrine, personal values, assumptions about Army culture, procedures, and personnel, knowledge based on previous experiences)." The *action-focused method* facilitated reflection on the link between action and action outcomes associated with a particular vignette. It included a guided comparison of the subjects own response rating to the average response of an expert group with questions that probed alternative assumptions about goals and action outcomes. For example, "Perhaps the (*comparison expert group*) and I had similar goals and identified a similar problem, but we preferred different actions. What outcome do you feel your actions would achieve? What outcome do you feel the students action would achieve?" The *condition and action method* facilitated reflection on aspects of both condition and action by incorporating elements of both the condition and action reflection methods. It included a guided comparison of subjects' own responses to average expert responses in terms of problem identification, goals, actions, and anticipated action outcomes. Sample reflection materials are displayed in Appendix F (1 – 3).

For the college life research effort, a reflection control condition was designed to provide a more stringent differential test of reflection methodology. It included two articles on relevant practical issues in college life, followed by a series of open-ended analytic questions pertaining to these articles. Questions facilitated reflection on personal reactions to the issues presented and examination of the relative benefits and drawbacks of solutions to issues presented. For example, a sample question on the topic of co-ed living is "What advantages and disadvantages do you see to having co-eds share bathrooms?" A sample reflection control is displayed in Appendix F (4).

EMPIRICAL STUDIES

Overview

Two related experimental studies were conducted to investigate the effect of reflection methods on practical problem solving in Army officer and college student samples using domain-specific and context-dependent measures that were developed to assess tacit knowledge in each sample. The first research effort involving an Army officer sample was discontinued midway through data collection because access to officers was suspended due to the Iraq War. The second research effort was designed to complete the testing of hypotheses with a college student sample.

Research Effort One: Developing Tacit Knowledge in Military Leadership

Based on the aforementioned conceptual discussion, it was predicted that training in reflection methods that focus on condition, action, or a combination of condition and action would improve practical problem solving as measured by performance on tacit knowledge assessments more than no such training. It was also predicted that reflection

methods that combine reflection on condition and action would be superior to those that focus on either condition or action independently.

Hypotheses

H1: Training using reflection methods will improve practical problem solving more than no reflection control.

H2: Training using methods that focus on both reflection on condition and reflection on action will improve practical problem solving more than either approach alone.

Method

Subjects

One hundred one (101) Army officers representing various branches at three Army bases in the Northeast and Midwest participated in the research effort. Twenty-nine (28.7%) were lieutenants (LTs), 30 (29.7%) were captains (CPTs), 22 (21.8%) were majors (MAJs), and 20 (19.8%) were lieutenant colonels (LTCs). Ninety-seven (96%) were men and 4 (4%) were women. Participants ranged in age between 22 and 50 years. The mean age of the participants was 32.9 years with a standard deviation of 6.8 years. One participant did not report age. Ninety-nine (98%) participants were native English speakers; one participant was not, and one did not report language status. Forty-eight . (47.5%) reported non-military leadership experience (e.g., restaurant manager, youth leader, sports captain, etc.), and 51 (51.5%) did not. Years in service ranged from 0 to 23 years; the mean was 10.6, with a standard deviation of 6.8 years. One participant did not report the number of years in service. The number of years in current rank ranged from 0 to 6 years with a mean of 2.2 and standard deviation of 1.5 years. Five participants did not list the number of years spent in their current rank. Table 1 presents the distribution of rank in each of the three experimental and control conditions. As can be seen in the table, the distribution of rank across conditions was largely consistent. However, due to limitations associated with sample access, the distribution of rank within each condition was variable.

Table 1. Officer rank across conditions.

| | | Experimental Condition | | | | Total |
		Control	Condition	Combined	Action	
Rank1	1lt or 2lt	2	10	9	8	29
	cpt	14	6	9	1	30
	maj	5	1	12	4	22
	ltc	5	11	0	4	20
Total		26	28	30	17	101

17

Procedure

Army officers participated in a single three-hour session. Participants were told the purpose of the research was to test methods to improve acquisition of experience-based knowledge in military leadership. Rank appropriate materials were distributed to participants. Demographic and motivation covariate surveys and a self-paced tacit knowledge pre-test were administered to participants followed by a short break (10–15 minutes). Following the break, participants received one of three experimental interventions (30–40 minute self-paced reflection exercise) or were placed in the control condition, in which they completed another tacit knowledge scenario. The control condition scenario contained similar instructions and was similar in structure to pre-and post-test scenario measures. Following another short break, a self-paced tacit knowledge post-test, a Satisfaction with Intervention survey (experimental conditions only), and cognitive ability tests were administered.

Measures

Tacit Knowledge and Practical Intelligence. Tacit knowledge and practical intelligence were assessed with tacit knowledge inventories and extended case study scenarios. Measures were counterbalanced to control for potential differences in difficulty. However, because access to military officers was discontinued during the course of the research, administration of measures according to the counterbalancing design was incomplete.

Tacit Knowledge in Military Leadership (TKML; Horvath, Hedlund , Snook, Forsythe, & Sternberg, 1998; Hedlund, Williams, Horvath, Forsythe, Snook, Wattendorf, McNally, Sweeney, Bullis, Dennis, & Sternberg, 1999). This survey features brief problem situations that may be encountered in Army leadership. There are three versions: one each for platoon-level, company-level, and battalion-level leadership, each of which contains 18 items. Eight vignettes were selected from each version of the TKML based on higher levels of agreement among experts on response options (i.e., the 70% confidence intervals around the expert mean ratings were smallest). A block of four vignettes from each tacit knowledge inventory was used as a pre-test, and a block of the other four was used as a post-test. Participants received rank-appropriate TKML vignettes (i.e., LTs received platoon-level TKML vignettes, CPTs received company-level vignettes, and MAJs/LTCs received battalion-level vignettes). Internal consistency estimates of the TKML ranging from 0.66 to 0.76 and evidence of construct and criterion-related validity have been reported.

Extended Case Study Scenarios. Two platoon-level case study scenarios that were developed for this research feature leadership problems that might be encountered by a platoon leader. The first scenario involves a unit that has undergone multiple changes in leadership and subsequent problems with discipline, performance, and chain of command. The second scenario involves problems associated with a first sergeant who exhibits a pattern of poor performance, possibly related to alcohol abuse. The scenarios include six open-ended questions designed to assess practical problem solving and tacit

knowledge in military leadership. A sample question is "What problems need to be addressed in this situation?" Participants responded to questions by speaking into digital voice recorders. Three trained research assistants scored transcribed responses. Inter-rater reliabilities, estimated by an intraclass correlation (two-way mixed effects), were .85 for PS2 and .84 for PS3.

Cattell Culture Fair Test of g (Cattell & Cattell, 1973). This test is designed to assess intelligence equivalently across cultural groups using non-verbal stimuli. The full test contains three scales, each of which is made up of multiple subtests. Two, timed subtests that require participants to select patterns from among figures from scale 2 were administered to measure fluid cognitive ability. The first subtest has 10 items and the second, 14 items. Full-scale reliabilities have been reported ranging from .85 to .91.

Mill Hill Vocabulary Scale (Raven, Raven, & Court, 1985). This un-timed, 66-item test of vocabulary is designed to measure crystallized cognitive ability. Participants are presented with a word and must select from among four options the closest synonym to the word presented. A short-form of the test containing 33 items was administered in this research. Full test split-half reliability of .90 and test-retest reliabilities of .87 to .95 have been reported.

Attitudes Towards Leadership Instruction. This survey was developed for this research to control for the effect of individual differences in the motivation to participate in leadership instruction. It contains eight evaluative statements about previous leadership instruction. A sample statement is, "I have found the leadership courses I have taken to be effective in helping me deal with leadership problems outside of the classroom." Respondents indicate the extent to which they agree with the statement on a three-point scale (1 = disagree, 2 = neither agree or disagree, and 3 = agree).

Satisfaction with the Intervention. This survey was developed for this research to control for the effect of possible differences in satisfaction with the interventions on post-test performance. Participants are asked to rate the degree to which they agree with a series of statements about the experimental intervention on a three-point scale (1 = disagree, 2 = neither agree or disagree, and 3 = agree). A sample item is " I learned something from the intervention."

<div align="center">Results</div>

Descriptive Statistics

Four participants completed rank-inappropriate versions of the assessments and one outlier was removed from the dataset. One significant outlier was also removed. Seven participants did not complete scenario measures and 10 failed to complete cognitive ability tests. Descriptive statistics are displayed in Table 2.

Table 2. Descriptive statistics

	N	Mean	SD
1. TKML pre-test*	96	3.236	1.322
2. TKML post-test*	96	2.767	1.290
3. PS2 Scen. pre-test	42	5.425	1.483
4. PS2 Scen. post-test	48	5.394	1.319
5. PS3 Scen. pre-test	48	5.395	1.319
6. PS3 Scen. post-test	42	6.046	1.513
7. Cattell	86	12.907	3.172
8. Mill Hill	86	19.034	3.411

*Scores represent the Euclidean distance from the expert mean

Reliability

Measures of internal consistency for all assessments were acceptable when Spearman Brown correction was applied to correct for test length. Reliabilities are displayed in Table 3.

Table 3. Reliabilities for measures in Research Effort 1

Reliabilities for measures in Research Effort 1		
Measure	Alpha (corrected)	N
TKML PL	0.64 (0.82)	8
TKML CO*	0.58 (0.80)	7
TKML BN	0.67 (0.84)	8
PS2	0.44 (0.76)	5
PS3	0.51 (0.81)	5
Attitude*	0.47 (0.78)	5
Satisfaction*	0.84 (0.95)	5
Mill Hill	0.91	33
	Split-Half	
Cattell	0.86	24

- item(s) with poor intercorrelations omitted
-

Group Comparisons

There were no significant mean differences between experimental and control groups on satisfaction, attitude, or cognitive ability covariate measures. There was no effect of version on TKML pre- or post-tests but evidence of a strong interaction of test version on scenario pre- and post-test scores ($F (1,87) = 24.567$, $p = .000$). Participants who received the PS2 in pre-test improved on the PS3 post-test. Participants who received PS3 in the pre-test declined slightly in the PS2 post-test, suggesting that the scenarios are not equivalent. Because of this finding and the incomplete administration of

the counterbalanced design, PS2 and PS3 scenario scores were not collapsed into combined pre-and post-test scores. Instead they were analyzed separately.

Scenario Validity

Scenarios, as compared to vignettes, require a different level of cognitive processing and mode of solution construction. They are information-rich relative to vignettes and require respondents to construct and articulate tacit knowledge content. In comparison, vignettes are relatively brief and respondents evaluate, rather than generate, response strategies. Moreover, regardless of format, tacit knowledge measures sample from a wide range of relevant, domain-specific knowledge. Therefore, individuals tend to have variable levels of experience pertaining to specific item content, which may decrease the likelihood that different measures will be highly related. While it is expected that tacit knowledge vignettes and scenarios should correlate, the nature of the construct and the differences in testing format would suggest modest correlations.

Because PS2 and PS3 scenarios were not equivalent as noted previously, each scenario was analyzed separately. Construct validity was assessed by examining correlations between scores for each scenario with scores on the TKML tacit knowledge vignettes (see Table 4). As can be seen in the table, PS3 was significantly related to the TKML. TKML pre-test (distance squared scores) and PS3 scenario scores were negatively correlated ($r (89) = -.25$, $p = .02$). TKML post-test was also negatively correlated with PS3 ($r (89) = -.24$, $p = .024$). Correlations between the PS2 scenario and TKML pre- and post-tests were lower and did not reach significance (TKML pre-test: $r (89) = -.132$, $p = .22$; TKML post test: $r (89) = -.136$, $p = .2$). Correlations between scenario scores and cognitive ability measures were small to moderate. PS3, but not PS2, marginally correlated with the Cattell, $r (80) = .204$, $p = .07$. PS2, but not PS3, correlated with the Mill Hill, $r (80) = .268$, $p = .016$. The differential correlations between PS2 and PS3 scenarios and tacit knowledge vignettes (TKML), as well as cognitive ability measures (Cattell and Mill Hill) may relate to differences in scenario difficulty.

Table 4. Correlations among TK measures and cognitive ability covariates.

Correlations

		TKML pre	TKML post	Ps2	Ps3	Cattel	Mill
TKML***Pretest	Pearson	1	.358**	-.132	-.250*	-.249*	-.071
	Sig. (2-	.	.000	.216	.018	.021	.517
	N	96	96	89	89	86	86
TKML***posttest	Pearson	.358**	1	-.136	-.240*	-.194	-.110
	Sig. (2-	.000	.	.203	.024	.074	.314
	N	96	96	89	89	86	86
Ps2	Pearson	-.132	-.136	1	.396**	.068	.268*
	Sig. (2-	.216	.203	.	.000	.547	.016
	N	89	89	89	89	80	80
Ps3	Pearson	-.250*	-.240*	.396**	1	.204	.064
	Sig. (2-	.018	.024	.000	.	.070	.572
	N	89	89	89	89	80	80
Cattel	Pearson	-.249*	-.194	.068	.204	1	.292**
	Sig. (2-	.021	.074	.547	.070	.	.006
	N	86	86	80	80	86	86
Mill	Pearson	-.071	-.110	.268*	.064	.292**	1
	Sig. (2-	.517	.314	.016	.572	.006	.
	N	86	86	80	80	86	86

**. Correlation is significant at the 0.01 level (2-

*. Correlation is significant at the 0.05 level (2-

***Distance scores should be interpreted in reverse

Hypothesis Tests

Tacit Knowledge Vignettes

To test the differential effects of experimental reflection methods and no reflection (control group) on tacit knowledge vignette performance, a GLM univariate analysis of variance was conducted with the TKML post-test as the dependent variable, experimental condition as the independent variable, TKML pre-test as a covariate, and simple contrasts between experimental and control groups. Results show a strong effect of condition, F (3, 91) = 3.743, p = .014. Contrasts show that only the combined condition and action reflection method was significantly different from the control group, contrast estimate = -.696, p = .034. Comparisons show that participants in the combined group ("comb") (M = 2.563, SE = .243) score better than those in the reflection on action group ("action") (M = 2.641, SE = .323), and in the reflection on condition group ("cond") (M = 3.209, SE = .243). Figure 2 displays the tacit knowledge marginal means in pre- (1) and post-test (2) for all experimental conditions.

These results partially support Hypothesis 1 and fully support Hypothesis 2. Only the combined reflection method, but not the methods that focused on either approach alone, improved practical problem solving as measured by the TKML more than the no-reflection control condition.

Figure 2. TKML marginal means pre (1) and post (2) test by experimental condition.

Tacit Knowledge Scenarios

As discussed previously pre- and post-test scenario scores were not compared because the PS2 and PS3 do not appear to be equivalent. To test the differential effect of experimental reflection methods and no reflection (control), the PS2 scenario was analyzed because there were an adequate number of participants who took it in each condition. The TKML pre-test score was used in place of a scenario pre-test score as a conceptually relevant proxy. A GLM univariate analysis of variance was conducted with the PS2 scenario post-test as the dependent variable, experimental condition as the independent variable, tacit knowledge vignette (TKML) pre-test and Mill Hill as covariates, with simple contrasts between the experimental and control groups. The Mill Hill covariate was included to provide an additional control for individual differences associated with verbal ability given the response format of the scenario differed from the vignettes.

Results show a main effect of condition on post-test scores F (3, 41) = 4.414, p = .009. Simple contrasts between experimental and control groups show that reflection on action was significant (contrast estimate = 1.725, p = .002), reflection on condition was marginally significant (contrast estimate = .939, p = .081), but, unlike results using the tacit knowledge vignette, the combined reflection on condition and action method was

23

not significant (see figure 3). Because the scenario task was more complex than vignettes and the training and post-training integration time brief, participants may have needed. more practice and integration time to benefit from the combined approach.

These results provide partial support for Hypothesis 1 in that training methods that focused on either reflection on condition or reflection on action improved practical problem solving as measured by the PS2 scenario as compared to the no-reflection control condition. However, results did not support Hypothesis 2; the combined reflection on condition and action method was not superior to either approach alone in PS2 scenario post-test performance.
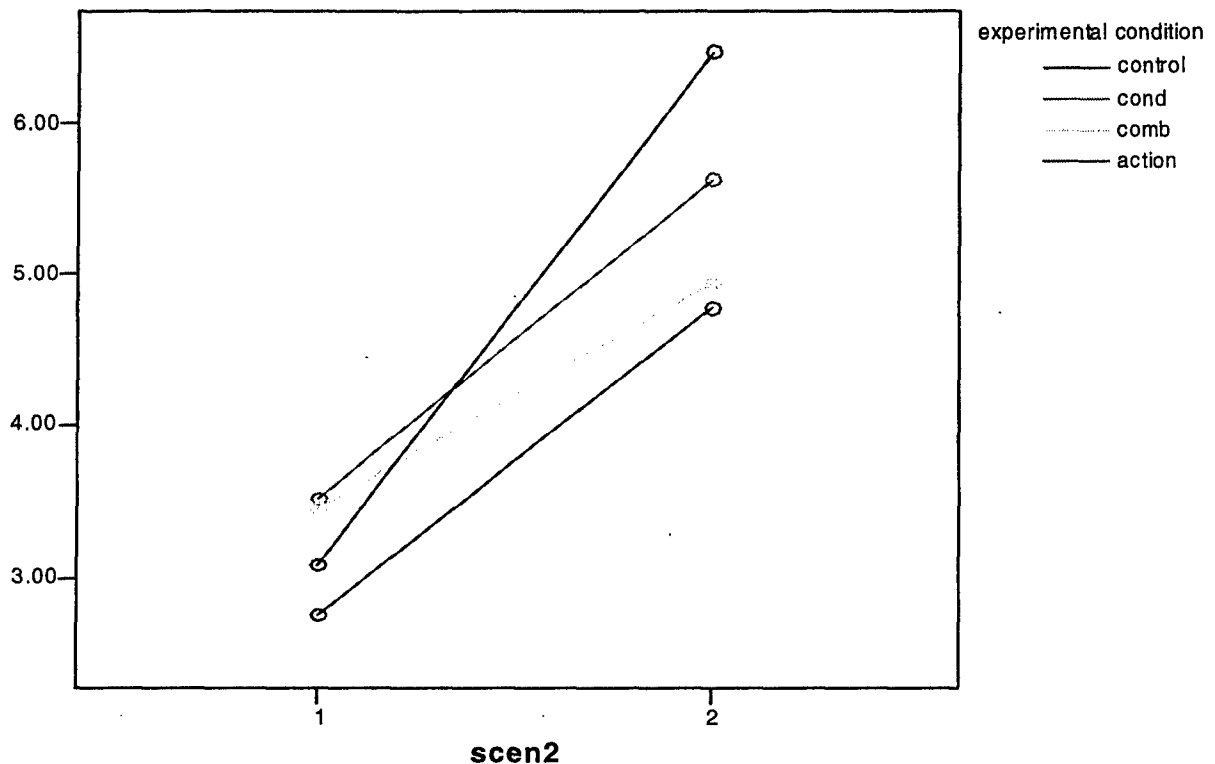

Figure 3. PS2 scenario marginal means pre- (1) and post- (2) test by experimental condition.

Discussion

Taken together these findings provide preliminary evidence that tacit knowledge can be facilitated by reflection methods that are derived from the theory of practical intelligence. Findings were mixed with regard to the relative effectiveness of reflection methods, depending upon the type of tacit knowledge measure employed. The combined reflection method was effective in improving tacit knowledge scores in vignettes, which provide limited information about a specific problem situation and require assessment of specified response strategies. Reflection on condition and reflection on action methods, but not the combined method, were effective in improving tacit knowledge scores in the PS2 scenario, which may be due to the more complex nature of the scenario task. All of the information that must be managed in the scenario task may make it difficult for participants to benefit from the more inclusive method in a brief intervention.

Research Effort Two: Developing Tacit Knowledge in College Life

Consistent with previous theoretical and empirical work on the acquisition of tacit knowledge, it was predicted that the method that combines reflection on condition and action would improve practical problem solving as measured by performance on tacit knowledge assessments more than a traditional, analytic reflection method.

Hypotheses

H3: Training using methods that focus on both reflection on condition and action will improve practical problem solving more than analytic reflection.

Method

Subjects

Participants were 235 college students from three universities in the Northeast and one in the Northwest. One hundred fifty-nine (68%) of the students were freshmen, 69 (39%) were sophomores, 7 (3%) did not report their status. Participant age ranged from 18 to 28 years with a mean age of 18.7 years. One hundred fifty-seven (67%) participants were women, and 78 (33%) were men. One hundred sixty eight (72%) were European American, 15 (6%) were Asian American, 11 (5%) were Hispanic American, 7 were African American (3%), 14 (6%) reported themselves as "other," and 20 (8%) did not report ethnicity. Two hundred twenty-two (94%) reported being native English speakers, 12 (5%) were not, and one participant did not report his native language status.

Procedure

Participants were paid volunteers ($30) who took part in a single three-hour session. They were randomly assigned to the experimental or analytic control conditions and told that the purpose of the research was to assess reflection methods for developing practical problem solving using materials that focused on college life. Covariate

surveys/tests and self-paced tacit knowledge pre-test materials were administered followed by a short break (10–15 minutes). Participants were instructed not to speak about research materials during breaks. After the break, participants completed either the experimental or control 30–40-minute self-paced reflection exercise. Following the intervention, participants took a more extended 25-minute break designed to mitigate fatigue and provide time for cognitive integration. During this time, food and drink were provided and participants watched a short segment of a comedy video. Following the break, they were encouraged to put forth the same level of effort as in the pre-test and tacit knowledge post-tests were administered. After completing the post-test, all participants completed the Satisfaction with Intervention survey.

Measures

Tacit Knowledge and Practical Intelligence. Tacit knowledge and practical intelligence were assessed using tacit knowledge inventories and extended case study scenarios. Measures were counterbalanced to control for potential differences in difficulty.

College Student Questionnaire (CSQ: Sternberg et al., 2000). The CSQ is made up of vignettes that describe problem situations that might be encountered by a college student followed by possible solutions, the quality of which participants rate on a seven-point scale (1 = high quality, 7 = low quality). Two sets of six vignettes were selected based on content to form roughly equivalent pre- and post-test blocks. Adequate reliability and validity of these measures has been reported in Cianciolo et al., (2004). A general group consensus approach to scoring was applied, in which scores were the Euclidean distance from the mean squared.

Extended Case Study Scenarios. Two college life case study scenarios, "English Class" and "Roommate," were developed for this research and are described earlier in this report. Four independent trained raters scored English Class responses and three independent trained raters scored the Roommate responses. All of the raters were graduate students and recent college graduates. Scenarios were scored on two dimensions, response content and thoughtfulness. Scoring content involved comparison to expert responses and scoring thoughtfulness involved assessing the quality of procedural cause-and-effect linkages in responses. The total score is a mean of content and thoughtfulness scores. For the English Class scenario, average inter-rater correlation was 0.52 and coefficient alpha across four raters was 0.82. For the Roommate scenario, the average inter-rater correlation was also 0.52 and the coefficient alpha across three raters was 0.8.

Cattell Culture Fair Test of g (Cattell & Cattell, 1961). This test of fluid cognitive ability was described in Research Effort 1.

Mill Hill Vocabulary Scale (Raven, Raven, & Court, 1985). This test of crystallized cognitive ability was described in Research Effort 1.

Attitude Towards Instruction. This survey was developed to control for the effect of individual differences in the motivation to participate in reflection exercises. It contains six evaluative statements, for example, "I would be interested in attending a workshop on how to succeed in college life." Respondents indicate the extent to which they agree with the statement on a five-point scale (1 = strongly disagree, 5 = strongly agree).
Satisfaction with Intervention Survey. This survey was developed for this research to control for differential satisfaction with the reflection method on performance. It contains six evaluative statements, for example, "I learned something from the intervention." Respondents indicate the extent to which they agree with the statement on a five-point scale (1 = strongly disagree, 5 = strongly agree).

Results

Descriptive Statistics

Two cases were removed from the dataset because one subject did not complete post-test and another had consistently inappropriate answers suggestive of a motivational problem. Descriptive statistics are displayed in Table 5. A comparison of pre-test means suggests that the English Class scenario may have been somewhat easier than the Roommate scenario.

Table 5. Descriptive statistics, Research Effort 2.

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std.	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
CLQ pretest (mean)	235	.77	4.53	2.3903	.81470	.547	.159	-.273	.316
CLQ posttest (mean)	235	.77	5.29	2.2775	.87041	.859	.159	.730	.316
Scenario pretest	235	9.50	35.50	25.4234	4.20381	-.343	.159	.551	.316
Scenario posttest	235	14.75	36.25	24.2046	3.64294	.045	.159	.531	.316
RM content pretest	117	1.54	4.00	2.8608	.46111	-.282	.224	.360	.444
RM thought pretest	117	1.25	4.33	2.9922	.64382	-.327	.224	-.096	.444
EC content pretest	118	1.17	4.33	3.0862	.54091	-.202	.223	.481	.442
EC thought pretest	118	1.00	5.00	3.1610	.78278	-.150	.223	.347	.442
RM content posttest	118	1.71	4.00	2.7560	.38833	.172	.223	.787	.442
RM thought posttest	118	1.33	4.17	2.7578	.59766	.142	.223	-.331	.442
EC content posttest	117	1.96	4.08	2.9734	.48470	.123	.224	-.430	.444
EC thought posttest	117	1.00	5.00	3.0385	.85640	-.364	.224	.134	.444
EC pre	118	1.19	4.34	3.0890	.49897	-.426	.223	1.258	.442
RMpre	117	1.50	3.94	2.9046	.47845	-.379	.224	.143	.444
Cattell total	235	5	19	12.49	2.782	-.164	.159	-.332	.316
Mill Hill total	235	4	28	16.27	3.256	.207	.159	.888	.316
Attitude total (sum)	234	12	27	19.60	3.043	-.149	.159	-.459	.317
Satisfaction total (sum)	234	9	29	21.93	3.382	-.828	.159	1.504	.317
Valid N (listwise)	0								

Reliability

Measures of internal consistency for all measures were acceptable, except for the Attitude toward Instruction Survey, which did not have a sufficiently high level of mean inter-item correlation to be used in final analyses. Reliability measures for the Mill Hill and Cattell cognitive ability tests were low. When a correction for test length was they

reached marginally adequate levels. Reliabilities of cognitive ability tests may have been lower in this sample because it was more likely to evoke test anxiety than in the Army officer sample. College students are regularly tested on coursework content, but not cognitive ability. In contrast, Army officers are accustomed to regular tests of cognitive ability. Alternatively the college students may have been less motivated. Cognitive ability test means were also lower in the college student as compared to the Army samples, which would not be otherwise expected. Results are displayed in Table 6.

Table 6. Internal Consistency estimates for Research Effort 2 measures.

	Alpha	n
College Student Questionnaire	0.78	12
English Class Scenario	0.74	8
Roommate Scenario	0.71	9
Attitude toward Instruction	0.45	6
Satisfaction with Intervention	0.72	6
Mill Hill	0.60 (.75)	33
	Split-Half	
Cattell	0.42 (.59)	24

Scenario Validity

The construct validity of scenario measures was assessed by correlations with CSQ tacit knowledge vignettes, which are displayed in Table 7. For reasons discussed in the description of Research Effort 1, modest correlations between tacit knowledge scenarios and vignettes were expected.

Scenario pre-test scores, which combine English Class and Roommate scenario pre-tests, correlate significantly with the CSQ vignette pre-test ($r (233)= -.162$, $p = .013$), which suggests convergent validity. As might be expected given measurement method, the CSQ pre-test correlates with the Cattell, ($r (233) = -.198$, $p = .002$), but not the Mill Hill, and the scenario pre-test correlates significantly with the Mill Hill, ($r (233) = .263$, $p = .000$) and approach significance with the Cattell ($r (233) = .108$, $p = .1$).

Group Comparisons

There were no significant mean differences between the experimental and control groups on gender, ethnicity, the Satisfaction with Intervention survey, the Mill Hill, or the Cattell. There was no main effect of test version on the CLQ pre- and post-tests. However, there was evidence of a strong interaction of test version and pre- and post-test scores (Hotelling T $(1,233) = 22.1$, $p = .000$). Participants who received the English Class scenario in the pre-test performed equally well on the Roommate scenario post-test. Participants who received the Roommate scenario in pre-test did much worse on the English Class scenario post-test. This may be because the English Class scenario was easier.

Table 7. Intercorrelations of tacit knowledge measures and cognitive ability covariates.

Correlations

		CLQ pretest (mean)	CLQ posttest (mean)	scenario pretest	scenario posttest	Cattell total	Mill Hill total
CLQ pretest (mean)	Pearson Correlation	1					
	Sig. (2-tailed)	.					
	N	235					
CLQ posttest (mean)	Pearson Correlation	.664(**)	1				
	Sig. (2-tailed)	.000	.				
	N	235	235				
scenario pretest	Pearson Correlation	-.162(*)	-.130(*)	1			
	Sig. (2-tailed)	.013	.046	.			
	N	235	235	235			
scenario posttest	Pearson Correlation	-.079	-.079	.350(**)	1		
	Sig. (2-tailed)	.226	.229	.000	.		
	N	235	235	235	235		
Cattell total	Pearson Correlation	-.198(**)	-.128	.108	.211(**)	1	
	Sig. (2-tailed)	.002	.051	.100	.001	.	
	N	235	235	235	235	235	
Mill Hill total	Pearson Correlation	-.077	-.054	.263(**)	.190(**)	.135(*)	1
	Sig. (2-tailed)	.238	.414	.000	.003	.038	.
	N	235	235	235	235	235	235

** Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed).

29

Hypothesis Test

To test the hypothesis that the experimental reflection method would improve performance on tacit knowledge measures more than the analytic reflection method (control), a GLM repeated measures ANOVA was conducted, with tacit knowledge vignette (CSQ) pre- and post-test as the within-subject variable and experimental condition, the between-subject independent variable. The results of the repeated measures ANOVA showed a marginally significant effect of condition on tacit knowledge post-test performance (Hotellings $T (1, 233) = .015$, $p = .06$).

To examine the effect of experimental conditions on post-test scenario scores, an analysis of variance was conducted in which the PS2 and PS3 scores were collapsed into scenario pre- and post-test scores. It should be noted, however, that because the scenarios appear to differ in difficulty, this analysis of variance must be considered exploratory. The collapsed scenario post-test data violated the assumption of homogeneity of variance (Levene's test $F (1, 233) = 3.87$, $p = .05$). Accordingly, a GLM univariate analysis of variance was conducted, with scenario post-test as the dependent variable, scenario pre-test as a covariate, and condition as the independent variable. In this test the effect of condition was not significant.

The difference in post-test variance was further examined to compare the possible differential impact of experimental condition on variance. The experimental group had significantly less variance than the control group, suggesting that experimental reflection method in particular might account for a reduction in variance. To further explore this phenomenon, the relationship between the two dimensions that were scored (content and thoughtfulness) was compared between conditions in a series of regressions in which scenario content scores were regressed on scenario thoughtfulness scores in pre- and post-tests. In the experimental group, but not the control group, post-test thoughtfulness scores predicted post-test content scores ($F (2, 115)= 30.84$, $p = .000$; $\beta = .282$, $t (1, 116) = 5.553$, $p = .000$), which further supports the possibility that the experimental reflection method may have had an impact on thought processing.

Discussion

This research provided a more stringent test of the experimental reflection method by comparing it to an analytic reflection control using practical, domain-consistent materials. These findings provide preliminary evidence that the combined reflection method improves practical problem solving, as measured by vignette performance, more than a closely matched analytic reflection method.

The impact of the experimental reflection method on scenario performance presents a more complex picture that requires further empirical research. Consistent with findings in Research Effort 1, the combined method did not improve scenario post-test scores. However, the experimental reflection method may have had a unique effect on thought processing as suggested by a significant difference in post-test variance found between the experimental and control groups, with a reduction of variance in the

experimental group. Moreover, thoughtfulness scores predicted content scores in scenario post-test for the experimental group but not the control group.

Scenario measures are more content-rich and, thus, require more complex cognition. Furthermore, responses call for the generation of solutions that involve articulation of tacit knowledge. Given these complexities, it is likely that more extensive reflection time, as well as intervening time between training and task performance for cognitive integration, may be needed for such methods to be beneficial.

GENERAL DISCUSSION

This investigation shows that the skills underlying the acquisition of tacit knowledge can be taught. Reflection methods derived from the theory of successful intelligence effectively promoted practical problem solving in research participants in applied settings in two distinctly different domains (i.e., military leadership and college life). Not only does theory-based reflection appear to be more effective than simple practice, as substantiated by the military leadership research (Research Effort 1), there is also evidence that certain types of reflection methods are more effective than others at promoting tacit knowledge. In the college life research (Research Effort 2), an analytic reflection method that prompted participants to examine and analyze domain-specific issues was less effective than a theory-based method that combined reflection on action and condition.

In brief interventions, the relative effects of reflection methods that focus on condition, action, or a combination of the two aspects of experience seems to depend on the level of task complexity. With tacit knowledge vignettes, methods that combined reflection on condition and action were effective. With tacit knowledge scenarios, methods that focused on condition, or action aspects separately were more effective than a combined approach. While the evidence suggests that a combined approach has an effect on cognitive processing of scenario tasks, whether or not this would have resulted in improved practical problem solving remains an empirical question.

Limitations

The primary limitation of this research is that transfer of training over time was not assessed. Post-test assessments followed reflection interventions in a single session. Furthermore, the amount of time required for reflection methods to enhance practical problem solving over time was not evaluated. Participants were engaged in reflection exercises for a brief time period (30 to 40 minutes). It is possible that certain methods may require more time than others to be effective. Moreover, as stated previously, this may depend upon the nature and complexity of the task. For example, scenario measures, which more closely simulate the complexity of real life issues, may require more time.

Analyses were limited in this investigation by the use of newly developed scenario measures, which were not equivalent. Tacit knowledge measures are domain-specific and consequently must be customized to the particular domain under inquiry.

31

While developing tacit knowledge measures that simulate the real world issues is labor intensive, this effort seems defensible when one considers that measures developed for assessment can be directly applied for development purposes.

Implications

While a variety of reflection methods have been advocated and used to enhance or foster the exchange of tacit knowledge in a range of workplace settings, the effectiveness of these methods may vary considerably depending upon how they are designed and implemented. This investigation is a primary step in identifying theory-based methods that facilitate the development and use of tacit knowledge. There is much more work to be done to verify the effect of reflection methods on learning and performance, identify that factors that moderate the relationship between reflection method and effectiveness, and examine the transfer of training over time. For example, in the military, differential effectiveness of reflection method and modes of implementation may depend on level of leadership. More experienced officers whose experience may no longer be appropriate in the current environment, may require different methods than less experienced officers who are just beginning to build a network of tacit knowledge in military leadership.

CONCLUSION

The greatest potential contribution of the theory of practical intelligence and previous work on tacit knowledge may be in improving our understanding of the process of on-the-job learning and ways to facilitate it. What we have learned from this inquiry is that even very brief reflection methods based on the theory of practical intelligence can improve practical problem solving. Further development of these and other theory based methods and measures promises to enhance the capacity of Military leaders to learn quickly and effectively from experience, a challenge that has never been more critical than in the current military environment.

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Appendices

Appendix A1. Military Scenario: Platoon Scenario (PS2)

Instructions

The following case study describes a problem that might be encountered by a platoon leader. You are asked to take the role of the leader described. You are also provided with some background information about the problem and various supplemental materials, such as reports or memos, that you may find useful in assessing the situation. We are interested in your thoughts and considerations in developing a response to this scenario.

We understand that some individuals taking this case study will have attained a rank higher than PL. These individuals have been PLs at one time, and have hopefully learned from their experiences, no matter how long ago they occurred. These individuals should fill out the case study with their advice, based on their own experiences, which they would give a new PL for how to handle the situations presented in the case study.

Please read through the scenario and determine the nature of the problem and what specific information is useful; then develop a solution. There are a series of questions at the end of the scenario to help you formulate a response. There are no right or wrong answers to these questions. We are not interested in textbook answers but rather in how you personally assess the situation and the response you develop to it. Please provide detailed and specific responses. The scenario should take 20–30 minutes to complete.

Overview

You are 2nd LT Pete Quandry, and have recently taken over an infantry platoon with 30 Soldiers and 4 Bradleys. Because you have just come on board as a PL, you need to learn a lot about weapon systems and procedures. The former PL left nothing on paper to help you get oriented.

The platoon is currently in a state of flux because PSG Joe Forte, just left. SSG Ed Newell, a squad leader, has been promoted from among his peers without a change in rank to replace him.

Apparently, your company commander CPT Powers was very dissatisfied with the previous PL but had a lot of respect for the former PSG because he kept the Soldiers in line. He clearly has high expectations of you and the platoon and has already given you responsibility for a new tactical mission. You and the CPT agree that this will be a great opportunity for you to develop your technical skills. You also hope it will be an opportunity to show him that you are competent.

2

<u>Background</u>

Apparently, CPT Powers found it so frustrating to work with the former PL that he often communicated directly with PSG Forte. PSG Forte had the reputation for being highly demanding and directive with the platoon. See attachment 1.

PSG Newell knows a lot about weapon systems and procedures. You are pleased that he seems interested and willing to share his expertise. You will need to rely heavily on him to successfully accomplish the mission next week.

The platoon has a mix of experienced and newly enlisted Soldiers. Several were in combat together. Attachment 2 is an early interaction with PSG Newell about the platoon.

The training records indicate that all of the Soldiers are current on their PT and weapons qualifications and Newell reports that the platoon has consistently met training standards. However, you have some serious concern about platoon performance because during recent FTX, you observed that the Soldiers piled out of the vehicles and lit cigarettes rather than setting up a secure perimeter as their battle drill dictated. You made an on-the-spot correction and later counseled Newell about this.

<u>One week before the mission</u>

On Monday morning this week you discover that one of the leader books was not up to date in the garrison. You address this immediately with the appropriate squad leader and emphasize the importance of knowing the whereabouts of Soldiers at all times. Later in the day you discussed the issue with PSG Newell who expressed a great deal of frustration because he had addressed this and other issues with the squad leaders previously and they seem to "yes" him without following through.

On Tuesday, there was an accident with one of the Bradleys in a training exercise. PSG Newell verbally reprimanded the Soldier and squad leader who were directly involved. See attached accident report.

This morning (Wednesday) you meet with PSG Newell to discuss details of the upcoming mission and your concerns about platoon performance. During the meeting he informs you that CPT Powers contacted him late in the day yesterday to inquire about how things were going with the mission. You were stunned to hear this because CPT Powers could have easily reached you yesterday at that time of day.

You only have a few days left to motivate your troops and prepare for the mission.

Questions: Please provide detailed and specific responses, thinking aloud about how you assess this situation.

PS2-1) What problems need to be addressed in this situation?

PS2-2) What is the single most important problem?

PS2-3) What COA would you take to solve the problem?

PS2-4) What specific outcome do you hope will result from the COA you have chosen?

PS2-5) What obstacles, if any, do you anticipate to obtaining this outcome?

PS2-6) What "lessons learned" or rules-of-thumb apply to this situation?

Attachment 1. An interaction with one of the NCOs

LT Quandry: How are things going?

SSG Pearson: Well, it's been much better now that Forte has gone.

LT Quandry: How so?

SSG Pearson: Well to be honest Forte was always breathing down our necks. I mean we need direction but we don't need to be told how to tie our shoelaces. Here's a classic example. Once he noticed that one of my Soldiers was late one morning. This Soldier was usually pretty good about showing up on time and I was planning on speaking with him about it afterward. Before I could get to him, Forte called me aside and told me what to say to the Soldier, how to say it and wanted me to report back to him about how the Soldier responded. I rarely got a chance to handle anything by myself. It wasn't just me...neither did anyone else.

LT Quandry: How do you think the Soldiers responded to him?

SSG Pearson: Well, some of them loved him, especially if he liked them. But mostly he intimidated them and all they really worried about was how he was going to react to things. It was like being a Squad Leader didn't really matter that much to them.

Attachment 2 (PS2). An interaction with PSG Newell about the platoon

LT Quandry: I would be interested in hearing any insights that you have about the platoon.

PSG Newell: Well, PSG Forte was hard on us, but everyone trained to standards.

LT Quandry: How about the personnel?

PSG Newell: They're good Soldiers, but two of our squad leaders, Amodio and Kane, don't get along very well. It's been going on a long time. Amodio was Forte's favorite so Forte always compared the other squad leaders to him. Kane didn't really hit it off with Forte, even though he had combat experience and so did Forte.

LT Quandry: How do the other Soldiers get along?

PSG Newell: Well to be honest with you there are a few Soldiers who have always seemed to be at each other's throats. It's been going on a long time and has never caused serious problems. I think because people were afraid of what Forte might do. But now that he's gone...well it kinda worries me.

LT Quandry: Sounds like something we need to keep an eye on.

U.S. ARMY ABBREVIATED GROUND ACCIDENT REPORT (AGAR)

For use of this form, see AR 385-40 and DA Pamphlet 385-40; the proponent agency is OCSA

REQUIREMENT CONTROL SYMBOL
CSOCS-308

1. TIME & DATE OF ACCIDENT a. Yr 02 | b. Mth 07 | c. Day 11 | d. Time 13 | **2. PERIOD OF DAY** X Day | Night | **3. ACDT CLASS** C | **4. ACDT OCCURRED DURING:** Combat | X Non-Combat

5. UNIT IDENTIFICATION a. UIC (6-digit Code) WABCCO | b. Name of Unit Co C. 3d BN, 6th IN | c. Unit's Branch IN | d. MACOM

6. LOCATION OF ACCIDENT a. Exact Location (Detailed enough to locate site)
b. Type Location F3
c. State/County | d. | Off Post X | On Post Name: | Yes X No
8. MISSION a. Briefly describe the mission Battle Drill enter and clear a trench | a. Present X | b. Involved No | Yes X No
b. METL Task? X Yes | No

7. EXPLOSIVES/AMMO a. Present No | b. Involved No

k. EIR/QDR Submitted Yes X No

8. VEHICLE/EQUIPMENT/MATERIEL INVOLVED

a. Type of Item (Nomenclature)	b. Model #	c. Ownership	d. Estimated Cost of Damage	e. Vehicle Collision	f. Failure Mode	g. Part Nomenclature	h. Part #	i. Part NSN	j. Part Manufacturer Code
#1 BFV	M2A3	DA	0						
#2									

10. WHY DID THE MATERIEL FAIL/MALFUNCTION? (Check the root cause(s) in Block e. In Block b. explain how the root cause(s) led to the materiel failure/malfunction.)

Materiel Failure/Malfunction Information

b. Describe how the materiel failed/malfunctioned and explain why (root cause)

a. LEADER (Not ready, willing to enforce standards)	STDS/PROCEDURES (Not clear, Not practical)	SUPPORT (Shortcomings in type, capability, amount or condition of equip/supplies/services/facilities)	
Direct Supervision	AR	SOP	Equip/Materiel improperly designed	Inadequate Manufacture
Unit Command Supervision	TM	Other	Equip/Materiel not provided	Inadequate Maintenance
Higher Command Supervision	FM	None exists	Inadequate Facilities/Services	Other

11. NAME (Last, First, MI) (include Address & UIC if different than Blks 5a &b.)
Johnson David D.

12. SOCIAL SECURITY # 304-76-9414

13. PERSONNEL CLASSIFICATION | **14. MOS** | **15. DUTY STATUS** X On-duty | Off-duty
18. AGE 20 | **17. SEX** M | **18. PAY GRADE** E1 | **19. FLIGHT STATUS** Yes X No

20. MOST SEVERE INJURY (See instructions) a. Degree | b. Type | c. Body Part | d. Cause

ACTIVITY OF INDIVIDUAL Provide code (from list in instructions) and describe in space below.

21. DAYS HOSPITALIZED 0

22. WORKDAYS
a. Lost 1
b. Restricted

23. CODE

24. SPECIFIC DESCRIPTION OF ACTIVITY/TASK
Platoon conducting a battle drill to enter and clear a trench. The BFV was slowing to a stop when the accident occurred.

25. PERSONAL PROTECTIVE EQUIP Helmet | **26. ALCOHOL/DRUGS CAUSE/CONT** Yes | X No | **27. EQUIP THIS PERSON WAS ASSOCIATED WITH?** (Enter item No. from Blk 9a)

| a. Required X Yes No | b. Type of equip #1 B #2 | c. Available #1 #2 | d. Used #1 #2 | **28. LICENSED TO OPERATE EQUIP** Yes X No | **29. HRS ON DUTY** 4 | **30. HRS SLEEP** 7 | **31. TACTICAL TRAINING** Yes X No | **32. TYPE TRAINING FACILITY** B | **33. LAST TRAINING** 3mo. | **34. FIELD TRAINING EXERCISE** X Yes If Yes, provide name: No | **35. NIGHT VISION SYSTEM USED** Yes If Yes, provide name: X No |

36. DID INDIVIDUAL MAKE A MISTAKE THAT CAUSED/CONTRIBUTED TO ACCIDENT? In Blk a., indicate if individual made a mistake. If yes provide the code (from instructions) in Blk b. and describe in Blk c.

c. Tell what the mistake was and how it caused/contributed to the accident
PVT Johnson stepped out of a moving BFV without waiting for communication from the squad leader. PVT Johnson was not wearing his helmet at the time of the accident.

a. Mistake X Yes No
b. Code '06
18C

DA FORM ... AP D JUL 94

USAPPC V2.00

37.

a. (Not ready, willing to enforce standards)	TRAINING (Insufficient in Content/Amount)	STDS/PROCEDURES (Not clear/Not practical)		SUPPORT (Shortcomings in type, capability, amount or condition of equip/supplies/services/facilities)		INDIVIDUAL (Mistake due to own personal factors)	
X Direct Supervision	School	AR	SOP	Equip/Material improperly designed	Inadequate Manufacture	Poor/Bad attitude	Fatigue
Unit Command Supervision	Unit	TM	Other	Equip/Material not provided	Inadequate Maintenance	Overconfident	Alcohol, Drugs
Higher Command Supervision	Experience, OJT	FM	None exists	Inadequate Facilities/Services	Other	X In a hurry	Fear/Excitement

WHY WAS THE MISTAKE MADE (ROOT CAUSE)(Check the root cause(s) in Blk a. In Blk b. tell how the root cause(s) led to the mistake.)

38. ENVIRONMENTAL CONDITIONS

a. Present:

#1 A — Yes [X] No [ ] Unk [ ]
#2 — Yes [ ] No [ ] Unk [ ]
#3 — Yes [ ] No [ ] Unk [ ]

b. Describe root cause(s) (reason) and tell how it/they caused the mistake

The squad leader did not use proper communication with the BFV crew to dismount. PVT Johnson opened the combat door before the BFV had come to a complete stop, and jumped to the ground. PVT Johnson lost his footing and fell backward striking his head on the base of the BFV door frame. PVT Johnson was not wearing his helmet and subsequently received a minor concussion.

39. PROVIDE BRIEF SYNOPSIS OF ACDT (Use additional sheets if required)(Explain sequence of events, tell how acdt happened.)

During an exercise, PVT Johnson was injured when he exited a BFV through the combat door before the vehicle had come to a stop. He lost his footing and fell backwards, striking his head on the base of the BFV combat door frame. PVT Johnson received a concussion and was unable to perform his duties for the remainder of the day. Contributing factors were the misuse of communication procedures, improper dismounting of the BFV, and PVT Johnson's failure to use regulation headgear.

40. CORRECTIVE ACTION(S) TAKEN OR PLANNED

A review of proper communication proceedures for BFV operations has been initiated and the platoon has rehearsed crew drill 07-3-D9233.

41. POINT OF CONTACT FOR INFORMATION ON THE ACCIDENT

a. Name (Last, First, MI)   Quandry   Pete   R.

b. Telephone #   DSN: COM:

42. COMMAND REVIEW a. Name

b. Signature

c. Rank

d. Date

43. SAFTEY OFFICE REVIEW

a. Name

b. Date

Case Study Instructions

The following case study describes a problem that might be encountered by a platoon leader. You are asked to take the role of the leader described. You are also provided with some background information about the problem and various supplemental materials such as reports or memos that you may find useful in assessing the situation. We are interested in your thoughts and considerations in developing a response to this scenario.

We understand that some individuals taking this case study will have attained a rank higher than PL. These individuals have been PLs at one time, and have hopefully learned from their experiences, no matter how long ago they occurred. These individuals should fill out the case study with advice, based on their own experiences, they would give a new PL for how to handle the situations presented in the case study.

Please read through the scenario and determine the nature of the problem, what specific information is useful and develop a solution. There are a series of questions at the end of the scenario to help you formulate a response. There are no right or wrong answers to these questions. We are not interested in textbook answers but rather in how you personally assess the situation and the response you develop to it. Please provide detailed and specific responses. The scenario should take 20–30 minutes to complete.

<u>Overview</u>

You are 1LT Anthony Santo, PL of a FSMC ambulance platoon with 5 wheeled-ambulance squads. Your platoon has been deployed overseas for three months. There has been no activity, although conflict in the region is brewing and the need for emergency medical services could occur at any time.

It has been difficult to keep the troops motivated this period of deployment. The environment is extremely hot and buggy. You sense a gradual decline in morale in many of the units, not just your own.

Your PSG, Tim Loyola, has been having a lot of difficulty with SSG Lewis, an ambulance squad leader in your platoon. You have a close working relationship with PSG Loyola, whose judgment in general you respect and trust. However, while he usually exhibits a high level of restraint and composure when dealing with personnel discipline

issues, increasingly you have noticed that he has been losing his temper, particularly in dealing with SSG Lewis.

Background

Loyola complains that Lewis isn't getting his job done properly and drinks too much. He finds it totally unacceptable that Lewis is not more conscientious about following SOPs. Loyola believes firmly in adherence to procedures and regulations. He thinks that something should be done about it. Although you agree that maintaining standards in the field is important, you wonder if he is sometimes overreacting to what seem to be minor infractions.

On more than one occasion Loyola observed Soldiers performing tasks that really should be handled only by Lewis. When asked about this, they say, "our SSG trusts us" or "he's asked us to help him out." The last time it happened Loyola insisted on knowing where Lewis was. The Soldiers said that they didn't know. Later Lewis told Loyola that he wasn't feeling well that morning.

SSG Lewis' record of past work performance is mostly good. His rescue efforts in combat are practically legendary. When he was a CPL, he extracted a Soldier who was impaled on a steel pole and administered emergency care, which kept him alive until he reached the treatment facility at BSA. The PL that he served under during that time is now CPT of your medical company. CPT Mahan still remembers Lewis and even asks about him from time to time. However, Lewis has had more than his share of "counseling sessions" for minor infractions mostly associated with preventative maintenance checks and services over the past few years. And you do recall seeing a letter of reprimand (attachment 1) in his file for disorderly conduct some time ago.

You are aware of "personal history" between PSG Loyola and SSG Lewis. Apparently they were good friends but had a falling our several years ago prior to Loyola's promotion to PSG.

10

SSG Lewis is very well liked in the platoon; he is quick witted and entertaining. It seems that the Soldiers in his squad trust him and will do almost anything for him.

Your CO CDR, CPT Mahan, is primarily concerned with ends rather than means. As long as the job gets done, he is not too concerned with official policy. He takes a hands-off approach and feels that any good PL should be able to handle personnel problems within his platoon. He also has an extremely liberal attitude concerning alcohol and has been very lenient about enforcing alcohol policies in the past. He believes that "Soldiers need to unwind" and he seems to recall fondly his own youthful bar room adventures that were a source of good fun and camaraderie.

Shortly before your unit was deployed, there was a very serious alcohol related accident that resulted in significant damage to emergency service equipment in another medical company. You remember receiving the battalion commander's memo on the Army's substance abuse prevention policy (attachment 2) at that time.

Recent events

Late in the day yesterday SSG Lewis approaches you and asks to speak with you about problems that he is having with PSG Loyola. You told him that you could not meet with him at that time and would get back to him about it.

It is morning, and you are walking through camp when you come across SSG Lewis and PSG Loyola in the middle of an argument:

> *PSG Loyola (forcefully):* And what's up with these sloppy supply records? Can't you keep anything straight?
> *SSG Lewis (calmly):* I am sorry they're out of order, here I'll double check them and...
> *PSG Loyola (shouting):* Is that alcohol I smell on your breath? Huh? Drunk on duty! I am going to nail you for this!
> *SSG Lewis (defensively):* I am stone sober! I drank until late last night, off duty. I am sober this morning...
> *PSG Loyola (shouting):* Bull! If you didn't drink so much maybe you could keep things straight around here!
> *SSG Lewis (shouting):* What the hell is your problem? You don't treat other squad leaders like this.

PSG Loyola (shouting): Like what? Huh? How do I treat you? You must think I'm stupid...

You can see that SSG Lewis' eyes are blood shot, but he does not appear to be drunk otherwise. The argument is escalating.

DEPARTMENT OF THE ARMY

XXX MEDICAL BATTALION

UNIT #XXX

APO AP XXXXX-XXXX

XXXX-XX   14 April, 2005
MEMO FOR: CPL John Lewis
From: XXX MED BN
Subject: Letter of Reprimand

1. Investigation has shown that you, CPL John Lewis, did, on or about December 18, 1999, at 129 Sentinel St. Norfolk, VA disturb the peace and engage in drunk and disorderly conduct, in violation of Article 134 of the Uniform Code of Military Justice (UCMJ). This offense is so serious that, had I elected to punish you under the provisions of Article 15 of the UCMJ, you could have been subject to incarceration or involuntary separation from the United States Army.

2. You are hereby reprimanded. Your actions have brought discredit upon yourself and require me to seriously question your judgment and sense of responsibility. Drunk and disorderly conduct is a serious offense which reflects badly not only on you as a person but as a member and representative of the Unites States Army.

3. I will not tolerate this type of behavior from a member of my unit. Be advised, should I be made aware of any future information concerning this type of behavior, I will take swift action, possibly resulting in your punishment under the provisions of the UCMJ and possibly your involuntary separation from the United States Army.

4. Examine your career objectives and determine which course you will follow. It's up to you.

5. You will acknowledge receipt of this reprimand below. If you wish, you may attach a written statement or additional documents to this reprimand which will be attached to this document in file. If you choose to do so, such attachments must reach my office by 15 January, 2000.

LTC Paul Jarmin,
Commander, XXX MED BN

Attachment 2. PS 3

DEPARTMENT OF THE ARMY
XXX MEDICAL BATTALION
UNIT #XXX
APO AP XXXXX-XXXX

XXXX-XX   25 April, 2005
MEMORANDUM FOR BATTALION LEADERSHIP

SUBJECT: Alcohol Awareness

1. References: AR 600-85 Army Substance Abuse Program (ASAP)

2. Most of you are aware of the recent alcohol-related accident that resulted in serious
injury to Army personnel and irreparable damage to medical equipment in our BN. In the
aftermath of this unfortunate accident, I direct your attention to Army policy and
procedures aimed at preventing alcohol abuse in the workplace. Outlined below are key
aspects of the policy. I urge you to review AR 600-85 Army Substance Abuse Program
(ASAP) in full and be prepared to fully implement this program as necessary.

3. Alcohol Policies and Controls
a. We will keep the workplace alcohol free. Also, alcohol will not be the center of
attention at Army functions.
b. Misconduct resulting from drinking alcohol, or impairment while on duty will not be
tolerated.
c. Leaders will ensure that subordinates are held responsible for their actions and are
aware of alcohol abuse and its consequences.
d. Leaders will refer Soldiers for screening, treatment, or prevention training if they know
that Soldiers are abusing alcohol.
e. Leaders are encouraged to do surprise inspections in the unit, not only to ensure
alcohol is not present on duty, but also to promote safety and good order and discipline.
f. If leaders suspect alcohol abuse, they must confront the suspected Soldier regardless of
rank or performance or conduct.
g. Even if a Soldier refers him/herself for treatment, he or she is still responsible for
his/her actions. Furthermore, if treatment fails, he or she must be removed from the
Army.
h. If a Soldier is identified as having a problem with alcohol, he or she must successfully
complete ASAP education or a rehabilitation program in order to remain in the Army.

4. Alcohol Sanctions
a. Soldiers may be punished under UCMJ (Articles 111 and/or 112) or separated from the
Army if they are involved in serious alcohol related offenses (more than two DWI
convictions in a 1-year period).
b. Any Soldier who performs duties with a blood alcohol level of .05 percent or above
will be subject to UCMJ and administrative disciplinary action. The only exception to

this is if the Soldier was unaware of the duties that needed to be performed at the time the Soldier became impaired.

c. Detoxification and appropriate treatment will be provided to any Soldier diagnosed as alcohol dependent.

Jim T. Swagart
LTC, XX
Commanding

Appendix B1. Scoring Rubric: PS2

PS2. SCORING INSTRUCTIONS

1. First, read and become familiar with the PS2 Quandry and the questions that follow.

2. Then, read carefully through the scoring rubric, and become familiar with the examples provided.

3. Set aside a block of time for scoring so that you aren't "squeezing" your scoring duties into other responsibilities.

4. Find a quiet place to work where you can spread out the rubric, responses, and writing utensils. Room 9 (the conference room) is a good place for this. The 309 building across the street is also an ideal place for scoring. Do not score responses in locations where you have several distractions, such as at home, around other people, cafes, etc. Distractions will add noise to your ratings that will reduce inter-rater reliability, which is an offense punishable by death.

5. Score one question (e.g., PS2-1) at a time, so that you can score as many responses for a single question on the same day, or in the same time period.

6. Place the score you have assigned to each question in the template provided, making sure that the ID number in the template corresponds to the ID number of the questions you're scoring.

INTRODUCTION

The scenarios and questions you have read are designed to present our participants with a complex mix of problems that a military leader may face. The problems can be solved with multiple possible solutions and outcomes, some of which would be more effective than others. The purpose of our scoring procedure is to determine and rate the extent to which leaders can identify the problems in a given situation, create an appropriate solution for addressing those problems, and anticipate the effects of his or her decisions and actions.

Please read each response carefully. Take your time to objectively evaluate each response, and assign a score in accordance with criteria given.

For acronyms, please refer to the attached acronym list.

1LT – 1st Lieutenant (not ILT)	SPC – Specialist
1SG – 1st Sergeant (not ISG)	SSG – Staff sergeant
ART. 15 – Article 15	TNG -- Training
BLUEFOR – Blue forces, friendly forces at NTC	UCMJ – Uniform Code of Military Justice (not VCMJ)
BN – Battalion	
CDR – Commander	
CO – Company or Commanding Officer	
COA – Course of Action	
FRAGO – Fragmentary order, partial orders.	
FTX – Field training exercise	
LDR – Leader	
NTC – National Training Center	
OPFOR – Opposing forces at NTC	
OPORD – Operational order	
PL – Platoon or Platoon Leader (not PH)	
PLT – Platoon (Not PH)	
PSG – Platoon Sergeant	
PVT – Private	
SOP – Standard Operating Procedure	

Scoring Rubric for PS2

1. What problems need to be addressed in this situation?

Points will be awarded for the number of *appropriate* problems listed by the respondent, and for the ratio of primary to secondary problems identified.

Inappropriate Problems

- Don't deal with the issues in the current situation
- Problems that, if solved prior to the situation, would have prevented it from happening (e.g., "the CPT shouldn't have given the order").

Immediate Problems

- Must be solved in order to address the most pressing issues in the current situation (e.g. "PL must assert leadership with the Soldiers"), rather than general to all problems (e.g. "leadership must improve")
- Characterized by any of the following
    o Near future time frame
    o High priority
    o Specific rather than general

Immediate Problems with Cause and Effects

- An immediate problem that demonstrates an understanding of factors that may result from it (e.g. "poor discipline is reducing safety")

Long-Term Problems

- Problems will likely become issues in the future or they seem immediate but are not specific (e.g., "the problem is poor leadership").

Long-Term Problems with Cause and Effects

- A long-term problem that demonstrates an understanding of factors that may result from it

ID: _____

Place a check mark in the appropriate box and use this scoring guide below to assign an overall score for this question

	Is the problem *Inappropriate*? (If checked move down to next problem)	Is it an *Immediate* +*Causality* problem?	Is it just an *Immediate* problem?	Is it a *Long-Term* + *Causality* problem?	Is it just a *Long-Term* problem?
Problem 1					
Problem 2					
Problem 3					
Problem 4					
Problem 5					

SCORING GUIDE

0 points – Respondent fails to answer the question

1 point – Respondent apparently understands what is being asked, but lists only *inappropriate* problems

2 points – Respondent lists one *long-term* problem only

3 points – Respondent lists one *long-term with cause and effects* problem only

4 points – Respondent lists one *immediate* problem only

5 points – Respondent lists one *immediate with cause and effects* problem only

6 points – a) Respondent lists more than 1 problem, but half or more of them are *inappropriate*

OR

b) Respondent lists more than one problem but all of them are long-term (*long-term* and *long-term with cause and effects*)

7 points – Respondent lists more than two problems but less than half of them are *immediate* or *immediate with cause and effects*

8 points – Respondent lists two problems; at least one is *immediate* and none are inappropriate
   *Add 1 pt. for each additional *immediate* problem provided

9 points – Respondent lists two problems; at least one is *immediate with cause and effects* and none are inappropriate
   *Add 1 pt. for each additional *immediate* problem provided

19

PS2-1 Examples

Inappropriate	Long-Term	Long-Term with Cause and Effects	Immediate	Immediate with Cause and Effects
PL needs to get on board and start learning his job	Different leadership styles within the platoon	The company commander communicating directly with the platoon sergeant without talking to the platoon is undermining the credibility of the platoon sergeant	The PL/PSG must assert their leadership roles and establish that the Soldiers must do what they say	Newell does not have credibility with the platoon because he hasn't expressed his intent as the new PSG to his subordinates
There shouldn't have been a promotion without a change in rank	The Soldiers' lack of respect and not following the leadership of the platoon		LT is in an unusually difficult position to establish credibility	New procedures for maintaining the safety standards have not been reviewed and this provides a risk to the upcoming mission
	Leadership within the platoon		PSG is unusually empowered because of the CPT	Poor morale and lack of respect and discipline in the unit is causing problems
	Lack of discipline		CPT has unrealistic expectations of the PL for the mission	
	The lack of standards in the unit		Unit is not ready for the upcoming mission	
	The company commander communicating directly with the platoon sergeant without talking to the platoon leader or without making the platoon leader aware		There are few resources available to handle the mission	
	PL is lacking guidance from the previous PL			
	PSG was promoted from among his peers w/o a change in rank			
	LT has questionable mentorship and supervision from CPT			
	CPT has unrealistic expectations of the PL generally			
	There are few resources in the unit			
	Safety standards generally need to be improved			

2. What is the single most important problem?

ID: _____

Place a check mark in the appropriate box and use this scoring guide below to assign an overall score for this question

Is a *Single Most Important* problem provided? (If checked move to right)	

If box is checked →

Are additional problems listed?	

If box isn't checked →

	Is it primarily an *Immediate* problem?	Is it primarily a *Long-Term* problem?
Problem 1		
Problem 2		
Problem 3		
Problem 4		

Single Most Important Problems
PSG does not have credibility with the platoon
Poor morale and lack of respect and discipline in the unit
Unit is not ready for the upcoming mission

SCORING GUIDE

0 points – Respondent does not answer the question
1 point – Respondent provides one or more long-term problems
2 points – Respondent provides a combination of *long-term* and *immediate* problems but none are *single most important* problems
3 points – Respondent provides one or more *immediate* problem(s) but aren't *single most important* problem(s)
4 points – Respondent lists multiple problems including one *single most important* problem
5 points – Respondent provides one or more *single most important* problems

SCORE: _____

3. What COA would you take to solve this problem?

ID: _____

The response to Q3 may specify one or more courses of action (COAs). Please rate *each* COA using the table below. You will need to refer to Q2 for these ratings.

Place a check mark in the appropriate box and use this scoring guide below to assign an overall score for this question

Is the response to Q3…

	Unrealistic (Whizzz)? If Yes, stop. Go down to next COA.		Related to the problem stated in Q2 or related to a S.M.I.P.? (Choose best answer.)			Provides a set of strategies?		Is Q2 also a S.M.I.P.?		Add total Points
	Y *Stop*	N *Go* (0)	No (1 point)	Loosely* (2 points)	Closely** (3 points)	Yes (3 points)	No (0 points)	Yes (1 point)	No (0 points)	
COA1	→	Go →	1	2	3	3	0	1	0	
COA2	→	Go →	1	2	3	3	0			
COA3	→	Go →	1	2	3	3	0			
	(All COAs are unrealistic =1 point total)	→	→	→	→	→	→	→	→	→

* *Loosely related - An outcome that is stated quite vaguely or does not make clear the links between problem and action.*
** *Closely related – A COA that is stated concretely or makes a clear link between problem and action.*

To compute overall score, sum up maximum point assignment for each COA.

SCORE: _____

22

4. What specific outcome do you hope will result from the COA you have chosen?

ID: _____

The response to Q4 may specify one or more outcomes. You will need to refer to Q2 and Q3.

Please rate each outcome by circling the appropriate numbers the table below, and following to the appropriate tables to compute a total sum score

Is the response to Q4...

Table 1

	Related to COA in Q3?			Related to the problem in Q2?			Subtotal	Subtotal greater than 2?	
	No	Loosely	Closely	No	Loosely	Closely	Add circled points	Go to Table 2	Put total in Score box
Outcome 1	1	2	3	1	2	3		Yes	No
Outcome 2	1	2	3	1	2	3		Yes	No
Outcome 3	1	2	3	1	2	3		Yes	No

Table 2

	Score from table 1	Abstract or Concrete?	
	Insert score below	Abstract	Concrete
Outcome 1		0	1
Outcome 2		0	1
Outcome 3		0	1

Score Box

	Score box	Subtotal from tables
Outcome 1		
Outcome 2		
Outcome 3		
Subtotal		
Subtract 1	-1	
Total score		

SCORE: _____

23

5. What obstacles do you anticipate to this outcome?

Points are awarded for the degree to which responses to this question reflect *insight* into the characteristics of the problem situation and *concreteness* of the obstacle provides.

Reflecting Insight
- Makes the connection between aspects of the problem and how this would manifest itself in the real world
- Only answers that provide actual obstacle are considered "insightful"

Concrete Obstacles

- Specific to this particular scenario
- Provides a detailed description of the obstacle

Abstract Obstacles

- More generalizable to other problem scenarios than this one (i.e. describing general aspects of human personality without linking it specifically to this scenario)
- Provides a more vague description of the obstacle

ID: _____

Please rate each outcome by circling the appropriate numbers the table below, and following instructions to compute a total sum score

Does the response to Q5...

	Indicate that no obstacles exist? (If circled move down to next obstacle)	Only describes, rewords, states some aspect of problem? (If circled move down to next obstacle)	Provides insight into the nature of problems presented and they relate to COA		Add total Points
			Provides an Abstract obstacle ?	Provides a Concrete obstacle?	
Obstacle 1	1	1	2	3	
Obstacle 2	→	→	2	3	
Obstacle 3	→	→	2	3	
(If entire answer is "no obstacles exist" or if it describes or restates the problem assign 1 total point ↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑					

* *Insight – Indicates understanding of the effects the COA would have on the unit and why it might not work..*
** *Abstract/Concrete– A response that is stated concretely or gives a detailed depiction. .*

To compute overall score, add points horizontally then

sum up maximum point assignment for each Obstacle.

SCORE: _____

Appendix B2. Scoring Rubric: PS3.

PS3 SCORING INSTRUCTIONS

1. First, read and become familiar with the PS3 Alcohol Soldier scenario and the questions that follow.

2. Then, read carefully through the scoring rubric, and become familiar with the examples provided.

3. Set aside a block of time for scoring so that you aren't "squeezing" your scoring duties into other responsibilities.

4. Find a quiet place to work where you can spread out the rubric, responses, and writing utensils. Room 9 (the conference room) is a good place for this. The 309 building across the street is also an ideal place for scoring. Do not score responses in locations where you have several distractions, such as at home, around other people, cafes, etc. Distractions will add noise to your ratings that will reduce inter-rater reliability, which is an offense punishable by death.

5. Score one question (e.g., PS3-1) at a time, so that you can score as many responses for a single question on the same day, or in the same time period.

6. Place the score you have assigned to each question in the template provided, making sure that the ID number in the template corresponds to the ID number of the questions you're scoring.

INTRODUCTION

The scenarios and questions you have read are designed to present our participants with a complex mix of problems that a military leader may face. The problems can be solved with multiple possible solutions and outcomes, some of which would be more effective than others. The purpose of our scoring procedure is to determine and rate the extent to which leaders can identify the problems in a given situation, create an appropriate solution for addressing those problems, and anticipate the effects of his or her decisions and actions.

Please read each response carefully. Take your time to objectively evaluate each response, and assign a score in accordance with criteria given.

For acronyms, please refer to the attached acronym list.

1LT – 1st Lieutenant (not ILT)	SPC – Specialist
1SG – 1st Sergeant (not ISG)	SSG – Staff sergeant
ART. 15 – Article 15	TNG -- Training
BLUEFOR – Blue forces, friendly forces at NTC	UCMJ – Uniform Code of Military Justice (not VCMJ)
BN – Battalion	
CDR – Commander	
CO – Company or Commanding Officer	
COA – Course of Action	
FRAGO – Fragmentary order, partial orders.	
FTX – Field training exercise	
LDR – Leader	
NTC – National Training Center	
OPFOR – Opposing forces at NTC	
OPORD – Operational order	
PL – Platoon or Platoon Leader (not PH)	
PLT – Platoon (Not PH)	
PSG – Platoon Sergeant	
PVT – Private	
SOP – Standard Operating Procedure	

27

1. What problems need to be addressed in this situation?

Points will be awarded for the number of *appropriate* problems listed by the respondent, and for the ratio of primary to secondary problems identified.

Inappropriate Problems

- Don't deal with the issues in the current situation
- Problems that, if solved prior to the situation, would have prevented it from happening (e.g., "the CPT shouldn't have given the order").

Immediate Problems

- Must be solved in order to address the most pressing issues in the current situation (e.g. "PL must assert leadership with the Soldiers", rather than general to all problems (e.g. "leadership must improve")
- Characterized by any of the following
  - o Near future time frame
  - o High priority
  - o Specific rather than general

Immediate Problems with Cause and Effects

- An immediate problem that demonstrates an understanding of factors that may result from it (e.g. "poor discipline is reducing safety")

Long-Term Problems

- Problems will likely become issues in the future or they seem immediate but are not specific (e.g., "the problem is poor leadership").

Long-Term Problems with Cause and Effects

- A long-term problem that demonstrates an understanding of factors that may result from it.

ID: _____

Place a check mark in the appropriate box and use this scoring guide below to assign an overall score for this question

	Is the problem *Inappropriate?* (If checked move down to next problem)	Is it an *Immediate +Causality* problem?	Is it just an *Immediate* problem?	Is it a *Long-Term + Causality* problem?	Is it just a *Long-Term* problem?
Problem 1					
Problem 2					
Problem 3					
Problem 4					
Problem 5					

SCORING GUIDE

0 points – Respondent fails to answer the question

1 point – Respondent apparently understands what is being asked, but lists only *inappropriate* problems

2 points – Respondent lists one *long-term* problem only

3 points – Respondent lists one *long-term with cause and effects* problem only

4 points – Respondent lists one *immediate* problem only

5 points – Respondent lists one *immediate with cause and effects* problem only

6 points – a) Respondent lists more than 1 problem, but half or more of them are *inappropriate*

OR

b) Respondent lists more than one problem but all of them are long-term (*long-term* and *long-term with cause and effects*)

7 points – Respondent lists more than two problems but less than half of them are *immediate* or *immediate with cause and effects*

8 points – Respondent lists two problems; at least one is *immediate* and none are inappropriate

   *Add 1 pt. for each additional *immediate* problem provided

9 points – Respondent lists two problems; at least one is *immediate with cause and effects* and none are inappropriate

   *Add 1 pt. for each additional *immediate* problem provided

SCORE: _____

29

PS3-1 Examples

Inappropriate	Long-Term	Long-Term with Cause and Effects	Immediate	Immediate with Cause and Effects
Alcohol shouldn't have been permitted at all while on deployment, period.	It seems your platoon sergeant has been acting a little different. You need to find out what's going on with him	Lewis may be going through underlying problem of home life or issues and the drinking just being the result of these problems not coming out openly	The impact of the professional relationship between sergeant Lewis and sergeant Loyola on mission accomplishment and their Soldiers.	Whether or not the staff sergeant is handing off work to his Soldiers that he should be doing because his drinking is making him feel ill
	Loyola may be getting stressed out.	Decreased morale due to the deployment and tensions mounting.	The argument that was escalating needs to be stopped and handled quickly and effectively	
	Alcohol use in the unit	Platoon leader can't handle personal problems and make policies because the company commander is not directly giving him guidance or action	Resolve the professional relationship problems between Loyola and Lewis	
	The leadership or communication problems that sergeant Loyola seems to be having with sergeant Lewis should be addressed		Loyola is taking a threatening approach to addressing performance issues with SSG	
	Your platoon sergeant Loyola possibly treating sergeant Lewis differently		Platoon sergeant Loyola's kind of overbearing approach and his temper	
	Inappropriate record keeping in the supply room		Alcohol is being consumed during deployment, which is against regulations	
	How do the two men view the actual performance of each		Lewis has chronic performance problems	
	Must deal with Soldiers who may be stressed by living conditions and the threat of danger		Ambiguity surrounding Lewis's drinking must be resolved	
	Soldiers are adapted to liberal alcohol use norms		PL must enforce a policy from above w/o support of his CO	
	Loyola overreacts to personnel performance issues and he's particularly rigid			

2. What is the single most important problem?

ID: _____

Place a check mark in the appropriate box and use this scoring guide below to assign an overall score for this question

Is a *Single Most Important* problem provided? **(If checked move to right)**

If box is checked →

Are additional problems listed?

If box isn't checked →

	Is it just an *Immediate* problem?	Is it a *Long-Term* + *Causality* problem?	Is it just a *Long-Term* problem?
Problem 1			
Problem 2			
Problem 3			
Problem 4			

Single Most Important Problems
Resolve the professional relationship problems between Loyola and Lewis
Ambiguity surrounding Lewis's drinking must be resolved

SCORING GUIDE

0 points – Respondent does not answer the question

1 point – Respondent provides one or more long-term problems

2 points – Respondent provides a combination of *long-term* and *immediate* problems but none are *single most important* problems

3 points – Respondent provides one or more *immediate* problem(s) but aren't *single most important* problem(s)

4 points – Respondent lists multiple problems including one *single most important* problem

5 points – Respondent provides one or more *single most important* problems

SCORE: _____

31

3. What COA would you take to solve this problem?

ID: _____

The response to Q3 may specify one or more courses of action (COAs). Please rate *each* COA using the table below. You will need to refer to Q2 for these ratings.

Place a check mark in the appropriate box and use this scoring guide below to assign an overall score for this question

Is the response to Q3...

	Unrealistic (Whizzz)? If Yes, stop. Go down to next COA.		Related to the problem stated in Q2 or related to a S.M.I.P.? (Choose best answer.)			Provides a set of strategies?		Is Q2 also a S.M.I.P.?		Add total Points
	Y Stop	N Go (0)	No (1 point)	Loosely* (2 points)	Closely** (3 points)	Yes (3 points)	No (0 points)	Yes (1 point)	No (0 points)	
COA1	→	Go →	1	2	3	3	0	1	0	▮
COA2	→	Go →	1	2	3	3	.0			
COA3	→	Go →	1	2	3	.3	0			▯
	(All COAs are unrealistic =1 point total)	→	→	→	→	→	→	→	→	

* *Loosely related - An outcome that is stated quite vaguely or does not make clear the links between problem and action.*
** *Closely related – A COA that is stated concretely or makes a clear link between problem and action.*

To compute overall score, sum up maximum point assignment for each COA.

SCORE: _____

32

4. What specific outcome do you hope will result from the COA you have chosen?

ID: _____

The response to Q4 may specify one or more outcomes. You will need to refer to Q2 and Q3.

Please rate each outcome by circling the appropriate numbers the table below, and following to the appropriate tables to compute a total sum score

Is the response to Q4...

Table 1

	Related to COA in Q3?				Related to the problem in Q2?				Subtotal	Subtotal greater than 2?	
	No	Loosely	Closely		No	Loosely	Closely		Add circled points	Go to Table 2	Put total in Score box
Outcome 1	1	2	3		1	2	3			Yes	No
Outcome 2	1	2	3		1	2	3			Yes	No
Outcome 3	1	2	3		1	2	3			Yes	No

Table 2

	Score from table 1	Abstract or Concrete?	
	Insert score below	Abstract	Concrete
Outcome 1		0	1
Outcome 2		0	1
Outcome 3		0	1

Score Box

	Score box
	Subtotal from tables
Outcome 1	
Outcome 2	
Outcome 3	
Subtotal	
Subtract 1	-1
Total score	

SCORE: _____

33

5. What obstacles do you anticipate to this outcome?

Points are awarded for the degree to which responses to this question reflect *insight* into the characteristics of the problem situation and *concreteness* of the obstacle provides.

Reflecting Insight
- Makes the connection between aspects of the problem and how this would manifest itself in the real world
- Only answers that provide actual obstacle are considered "insightful"

Concrete Obstacles

- Specific to this particular scenario
- Provides a detailed description of the obstacle

Abstract Obstacles

- More generalizable to other problem scenarios than this one (i.e. describing general aspects of human personality without linking it specifically to this scenario)
- Provides a more vague description of the obstacle

34

ID: _____

Please rate each outcome by circling the appropriate numbers the table below, and following instructions to compute a total sum score

Does the response to Q5....

	Indicate that no obstacles exist? (If circled move down to next obstacle)	Only describes, rewords, states some aspect of problem? (If circled move down to next obstacle)	Provides insight into the nature of problems presented and they relate to COA		Add total Points
			Provides an Abstract obstacle ?	Provides a Concrete obstacle?	
Obstacle 1	1	1	2	3	
Obstacle 2	→	→	2	3	
Obstacle 3	→	→	2	3	

(If entire answer is "no obstacles exist" or if it describes or restates the problem assign 1 total point

↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑

* *Insight* – Indicates understanding of the effects the COA would have on the unit and why it might not work..
** *Abstract/Concrete– A response that is stated concretely or gives a detailed depiction.* .

To compute overall score, add points horizontally then

sum up maximum point assignment for each Obstacle.

SCORE: _____

35

Appendix C. Procedures for Developing College Life Scenarios

Generating the contextual framework

Nine resident advisors from a liberal arts college in the MidAtlantic were interviewed for one hour via the telephone. They were asked to describe experiences that taught them important lessons about college life. From these interviews, researchers culled common themes and developed four sample scenario drafts that featured situations that may be encountered in college life

Developing the final two scenarios

Two final scenarios were created that integrated some aspects of the four original drafts. They were designed to provide enough information so that there might be multiple ways to interpret the nature of the problem and construct a potential solution. Open-ended questions were added to measure the cognitive components of tacit knowledge.

Both scenarios were piloted with a group of eight upperclassmen that provided written responses to scenarios questions and, then, discussed their reactions to scenario description, in terms of realism, and questions, in terms of understandability. Minor revisions were made to improve upon realism and expand the range of potential responses.

Appendix D1. College Life Scenario: Roommate

Instructions

The following case study describes problems that may be encountered by a college student. You are asked to take the role of the student described. You are also provided with some background information about the problems presented that you may find useful in assessing the situation. Please read through the scenario and determine the nature of the problems presented and what specific information is important to consider, and then develop a response to questions presented at the end of the scenario.

Please explain your thoughts and considerations used in constructing a response. There are no right or wrong answers to these questions. We are interested in your personal assessment of and response to the situation rather than a textbook type answer. Please provide responses that are thoughtful, detailed and specific. This scenario should take 20-30 minutes to complete.

Overview

You are a college freshman living in the residence halls. Your roommate, Jamie, was randomly assigned to live with you at the beginning of the academic year, and the two of you have gotten along quite well up until this point. But, tensions are rising, not only because of midterm exams next week, but also because lately Jamie hasn't been her normal self. This semester, more often she seems down.

Lately Jamie has been neglecting her studies and spends more time partying on the weeknights. You are aware of all of this, want to be supportive as a friend, but you are not sure what to do.

Background

Jamie seemed like the kind of person who could be your best friend from the moment that you met. The move to college had been particularly difficult for you because you had never been away from your family for an extended period of time. The friendship that you formed with Jamie was a big help. She introduced you to new people, made you feel comfortable in new social situations, and always helped you adapt to your new surroundings. Now that you've entered the second semester, Jamie seems less and less willing to study or hang out like she used to. Lately, she prefers drinking and going to parties. Jamie also seems to be sleeping very little, and often you find it difficult to sleep because she is so loud.

In your many attempts to understand Jamie's change of character, she has never identified a single problem, but occasionally mentions how much happier she was in high school, and, now that she's in

college, how confused she feels about what to do with her life. You have wondered what's going on with her family because she rarely seems to speak with them. When you ask about her family, she says everything is fine and doesn't elaborate.

Recent Events

You have begun to worry more and more about Jamie. You notice that she missed class twice this week. You also notice that she has skipped out on her intramural soccer practices. You tried to encourage her to join you in doing things that you typically enjoy together, like going to the movies, but Jamie is completely uninterested.

Academics have been more challenging for both you and Jamie this semester. The Professors seemed to have taken it easy on the freshmen during the first semester so that they could get used to college life. However, course work this semester seems much more demanding and both you AND Jamie are feeling more stressed by it. You are taking a rigorous class together and, because Jamie keeps missing class, she often asks you to help her with her homework.

The situation with Jamie is really taking its toll on you. You often find it difficult to concentrate in class. Rather than thinking about the lesson, you find yourself trying to figure out what to do about Jamie. And, not only is your lack of concentration affecting the time you spend in the classroom, it is also affecting your homework. You also find yourself tired during the day because Jamie has kept you up late the night before.

Because of your concern, you sent an e-mail about it to one of your high school friends, Sue, who attends a different college than you. Her response was as follows:

> *Hey,*
> *Sorry to hear about your roommate. I don't think you should get too worried though. Lots of my friends are freaking out right now. School is just getting tougher. The teachers think we can handle it all now and are laying it on us. I mean, I didn't see one of my friends for a week because she had to finish a class project. Your roommate's behavior change doesn't mean she has any serious problems. It's just natural that your mood goes up or down based on the amount of work you have to do. So maybe your roommate might be down right now but it's probably only temporary.*
> *Don't worry too much about it and have fun this year!*
> *Sue*

Next week is midterms. Jamie doesn't seem to be studying at all. Last night she got pretty drunk and you ended up staying up to take care of her again. You are very worried about doing well next week especially because of this situation with Jamie.

Questions: Please provide detailed and specific responses indicating how you assess and would respond to this situation.
1) What problems need to be addressed in this situation?
2) What is the single most important problem?
3) To resolve the problems in this situation effectively, please describe in detail what actions you would take.
4) To resolve this situation effectively, what would you be sure NOT to do?
5) What specific outcomes do you hope will result from the course of action you have chosen?
6) What obstacles, if any, do you anticipate when obtaining these outcomes?

Appendix D2. College Life Scenario: English Class

Instructions

The following case study describes problems that may be encountered by a college student. You are asked to take the role of the student described. You are also provided with some background information about the problems presented that you may find useful in assessing the situation. Please read through the scenario and determine the nature of the problems presented, what specific information is important to consider, and develop a response to questions at the end of the scenario.

Please explain the thoughts and considerations you used in constructing a response. There are no right or wrong answers to these questions. We are interested in your personal assessment of and response to the situation rather than a textbook-type answer. Please provide responses that are thoughtful, detailed, and specific. This scenario should take 20–30 minutes to complete.

Overview

You are a college sophomore who is enrolled in a rather difficult upper-level English class. You are used to getting rather high marks on your papers, and you have already put a lot of time and effort into your English class. But, the last two papers that have been graded and returned to you have had lower grades than you anticipated, leading you to question your English professor's grading strategy. There is an upcoming group project, (for which every group member will receive the same grade), worth 15% of your entire semester grade, on which you hope to do well to make up for the poor grades on your papers.

Background Information

Dr. Asher, your English professor, has been with the university for close to 30 years and is highly respected on campus for his literary achievements as well as for his excellent and very demanding teaching. Yet, it is known among the students that Dr. Asher "plays his favorites" in the class. You have heard that Dr. Asher tends to favor students who have taken another of his classes prior to this one. This, however, is your first time in one of his classes.

You got a "C+" on your first paper. You were disappointed by the grade, not only because of all the time you had put into the paper, but also because you had never received lower than a B+ on a paper in your previous two college English classes. Furthermore, the comments on the paper were rather general and the reasons why you received such a poor grade were not apparent.

You decided to approach Dr. Asher to ask for help with the next paper, which is due the next week. His only advice was to start the paper early and seek help at the Writing Help Center.

TIMELINE

Monday, October 9th: You took the advice Dr. Asher offered, began the paper early, and reviewed it with an assistant in the "Writing Help Center" on campus. You turned the paper in today, confident that this paper was better than the last.

Today in class, you also received assignments for the group project, due on October 25th—two and a half weeks from now. Unfortunately, students didn't get to pick fellow group members. Students assigned to your group agreed to meet on Friday.

Friday, October 13th: During your first real group meeting, you all picked the parts of the project for which you would be responsible. One of your group mates, Catherine, who seems to work as hard as you do, also wants to get a good grade in the class. She has not had any problems with her previous papers. The other person, Ron, seems to care, but his ideas are outlandish and at times very impractical. You also don't like his egotistical "know it all" attitude. He seems to think he is a more advanced student because he has taken an earlier class with Dr. Asher. You have also observed that he gets along very well with Dr Asher. You all agreed to meet on Wednesday to begin to put your individual pieces together.

Wednesday, October 18th: At this meeting, you and Catherine discovered that you don't like Ron's work. It looks like it he didn't put in the effort you felt was necessary. Since his ideas for the project were not very practical, and his written work seemed disorganized and confusing, it felt like you were going around in circles trying to decide what to do with his section. You began to feel that he was almost not worth having on the team. You and Catherine dismissed most of his ideas and decided to go with your own. Ron did not say much to either of you after the meeting. The following night you and Catherine spent hours working on Ron's section without including Ron.

Today, Friday, October 20th: At the beginning of class, Dr. Asher takes a moment to discuss the group project. He indicates that he is "seriously concerned" because he has heard some people complain

41

about being left out of their groups. "This project," he states, "is not just about getting a good grade. It's about learning how to work as a team." He ends with a chilling remark about how one's actions in this project could, in fact, affect their overall class grade.

At the end of class he hands back the second paper. You are stunned to see another "C+" written across the top. There are as few comments as the 1st paper. When Dr. Asher hands back Ron's paper, you are surprised to see a "B+" written at the top.

You have one more week before this project is due (October 27th), and you are supposed to meet with Ron and Catherine later on tonight to work on the project. You are not sure what to do.

Questions: Please provide detailed and specific responses, indicating how you assess and would respond to this situation.

1) What problems need to be addressed in this situation?
2) What is the single most important problem?
3) To resolve the problems in this situation effectively, please describe in detail what actions you would take.
4) To resolve this situation effectively, what would you be sure NOT to do?
5) What specific outcomes do you hope will result from the course of action you have chosen?
6) What obstacles, if any, do you anticipate when obtaining these outcomes?

Appendix E1. Scoring Rubric: Roommate Scenario

College Life Scenarios: Guidelines for Scoring

Introduction

The College Roommate Scenario is made up of six open-ended questions designed to assess experience-based (tacit) knowledge in college life. In a nutshell, we need to assess the extent to which responses reflect knowledge that experienced college students may have acquired about college life. We have collected data from college life "experts," i.e. college seniors/graduates, for comparison purposes.

Your job is to rate responses to these open ended questions on a five-point scale. Below you will find detailed guidelines for scoring each question. The first three questions involve rating on two broad dimensions, content and thoughtfulness. The final three questions are rated based on the content dimension only.

Please review the attached Roommate Scenario followed by open-ended questions that respondents answered. Then read the scoring guideline for each question fully before you begin to rate responses.

Feel free to contact us should you have any difficulties or questions. Cynthia Matthew can be reached at Cynthia.matthew@yale.edu or (436-1544), and Cassandra Nichols at Cassandra.Nichols@yale.edu or (432-3858).

Thank you and have fun!

Scoring Guide: Roommate Scenario

Question 1: Content   "What problems need to be addressed in this situation?"

This question is rated on a five-point scale that considers the extent to which the responses capture the knowledge conveyed in expert responses, which is summarized below. Basically, the more problems on the expert list that are included in the response, the higher the score. Below is a summary of expert responses and rating scale guidelines including *examples*.

Expert Response Summary	Five Point Rating Scale Guidelines

1. Jamie's problems:
  a) May be symptomatic of deeper mental/emotional issues
    i. Depression
    ii. Drinking
    iii. Family problems
  b) Are compromising her health, grades and academic career
  c) May lead to future safety, health, and career problems.
2. The effect on me
  a) Are compromising your health, grades and academic career
    i. Loss of sleep
    ii. Preoccupation with Jamie's problem
    iii. Loss of concentration on my studies.
  b) May lead to future health and academic problems.
  c) Loss of /miss her friendship
3. The effect on friendship
  a) Straining it
  b) Poor communication
  c) Behavior is not respectful
  d) Jamie is taking advantage of me by using my school work
  e) Behavior could lead to resentment and eventual breakdown in friendship
4. How to help Jamie
5. How to take care of myself
  a) Study in the library
	1. Response indicates a problem or comment that is <u>not included</u> in the expert summary or does not answer the question, (e.g., *"Missing classes"*).
	
	2. Response covers one of the problem areas listed by experts, (e.g., *"Jamie's partying, not sleeping, and skipping classes, and not doing any work"*).
	
	3. Response covers two of the problem areas listed by experts, (e.g., *"The fact that Jamie is taking away my study time too. Why Jamie has changed. What is wrong?"*).
	
	4. Response covers three of the problem areas listed by experts, (e.g., *"What is wrong with Jamie? Jamie is losing her focus in school and needs help getting back on track. My lack of sleep and midterms are coming up"*).
	
	5. Response covers four or more of the problems areas listed by experts, (e.g., *"Why Jamie has suddenly changed her behavior. Whether family problems, stress, or workload relate to her change in behavior. What should be done to help Jamie (professionally) so you both can live with each other? Rules for the room so Jamie doesn't keep you up late"*).

Question 1: Thoughtfulness   "What problems need to be addressed in this situation?"

This five-point rating scale assesses the complexity of thought in the response. Ratings are based on the extent to which the response reflects an understanding of potential "causes and effects" associated with the problem situation. In other words, knowledge of possible underlying factors that may have given rise to the problem, and/or the future consequences if the problem is not addressed. Below are rating scale guidelines including *examples*.

5-point rating scale guidelines:

1. Response does not suggest a cause and effect association.
    a. It does not ask why the problem may exist or consider possible consequences that may result.
    b. It is completely off topic
    c. It merely provides a recitation of the problems listed in the scenario.
    (e.g., *"Attending and studying for class. I don't think partying and drinking is a problem."*)

2. Response suggests a cause and effect linkage that focuses on a superficial or tangential aspect of the problem.
    (e.g., *"Jamie could get hurt one night when she is drunk...The problem could get worse and ruin our friendship."*)

3. Response suggests a cause and effect that is central to the problem situation and stated rather generally. It does not suggest specific reasons or consequences.
    (e.g., *"Why is she not feeling like herself? Why is she not going to class? Why is she drinking and partying so much?"*)

4. Response suggests a central cause and effect linkage and suggests relevant underlying problems or potential consequences.
    (e.g., *"What is making Jamie feel so down? Is there something going wrong in her family? Is she depressed/having depression? Why does she not want to go to class? Does she feel all alone and feel like no one cares about her?"*)

5. Response suggests a central cause and effect that includes statements about relevant underlying problems, possible consequences of the problem if they are not addressed, and how a solution might be found.
    (e.g., *"The fact of her staying up all night because it is keeping you up too. Temporary mood swings or not, she's being inconsiderate. Also, that you have to take care of her. She gets drunk, she should learn from it. Babying someone won't teach them anything. What's going on in her head. Although she has no obligation to tell you."*)

45

Question 2: Content "What is the single most important problem?"
This rating scale is based on the extent to which the response captures expert responses in terms of content and specificity. Expert responses are broken down into: major problem areas and related subcategories, which are specific examples of the broader category (in **bold** type); and less significant problem areas, and related subcategories (not in bold type). Below is a summary of expert responses and rating scale guidelines including *examples*.

Expert Response Summary	Five-point rating scale guidelines

1. **Jamie's problems:**
   a. **Possible psychological problem: depression, drinking and/or family problems**
   b. **Possible emotional instability**
      i. Compromising her health, grades and academic career.
2. **The effect on me:**
   a. **My personal well-being**
      i. Loss of sleep
   b. **My overall academic performance**
      i. My midterm performance
3. The effect on our friendship
   a.   Poor communication
   b.   Behavior is not respectful
   c.   Jamie is taking advantage of me
4. **How to address both problems 1 & 2**
   a. **Trying to find a balance between saving our friendship and protecting myself.**
   b. Reacting appropriately to the situation
	1. Response focuses on a problem that does not appear in the expert summary or does not answer the question, (e.g., *"There is not a single most important problem. All have affected her in different ways and all need to be dealt with"*).
	
	2. Response selects a sub-category which is included in the expert summary but is a not a major subcategory, and, therefore, not in bold type, (e.g., *"Studying for midterms"*).
	
	3. Response indicates **one of the major categories** listed by the experts in bold type but very generally stated, i.e. without subcategory information, (e.g., *"Her affecting my study habits"*).
	
	4. The response indicates **one of the major categories** and any additional subcategory information that suggests a more developed understanding of the major problem area, (e.g., *"Jamie is not being respectful to my needs, especially around the crucial weeks of midterms. She should take into consideration how her actions affect me"*).
	
	5. The response **integrates more than one major category** and suggests a developed understanding of how problem areas are linked, (e.g., *"Probably the drinking because it affects Jamie's schoolwork, sleep patterns, and probably moods, and it also affects my studying and sleeping time as well"*).

Question 2: Thoughtfulness   "What is the single most important problem?"

This five-point rating scale assesses the complexity of thought in the response. Ratings are based on the extent to which the response reflects an understanding of potential "causes and effects" associated with the problem situation. In other words, knowledge of possible underlying factors that may have given rise to the problem, and/or the future consequences, if the problem is not addressed. Below are rating scale guidelines including *examples.*

5-point rating scale guidelines:

1. Response does not suggest a cause and effect association.
   a. It does ask why the problem may exist or consider possible consequences that may result.
   b. It is completely off topic
   c. It merely provides a recitation of the problems listed in the scenario.
   (e.g., *"Jamie's behavior."*)

2. Response suggests a cause and effect linkage that focuses on a superficial or tangential aspect of the problem, (e.g., *"That she doesn't study and midterms are in a week"*).

3. Response suggests a cause and effect that is central to the problem situation and stated rather generally. It does not suggest specific reasons or consequences, (e.g., *"Can she handle being in college?"*).

4. Response suggests a central cause and effect linkage and suggests relevant underlying problems or potential consequences, (e.g., *"Jamie cutting into my time and my success (college is not cheap)"*).

5. Response suggests a central cause and effect that includes statements about relevant underlying problems, possible consequences if the problem if they are not addressed, and how a solution might be found, (e.g., *"The most important thing is getting Jamie back on track. Not only will that help her, but it will make life a little easier for me"*). ·

Question 3: Content   "To resolve the problems in this situation effectively, please describe in detail what actions you would take?"

The five-point rating scale assesses the extent to which the participant's course of action (COA) overlaps with the expert responses in terms of *both* content and sequence. The summary of expert responses has been organized into 4 general "types" of COA's mentioned by the experts that have been placed in the order that they should appear from first to last. Below is a summary of expert responses and rating scale guidelines including *examples.*

Expert Response Summary	5-point rating scale guidelines

1) Speak with Jamie about the problem
 	
  a) Content
    i) Reflect your honest observations and concerns
    ii) Address how her behavior is affecting you (e.g.,"You need to express your need for more sleep and for her not to depend on you for school work, etc.")
 	
  b) Approach
    i) Be supportive—let her know you are there for her and ask if you can help.
    ii) Confront her; be stern, but make sure she understands your doing this because you care.
 	
2) Change your own "enabling" behavior
 	
  a) Suggest some sort of acceptable compromise for both Jamie and myself.
    i) Ask her to be quiet when she comes in late at night
    ii) Work out a fairer arrangement regarding the difficult class you both take so that you aren't doing all the work (e.g."Set up an arrangement such that she and I each attend alternate classes and fill each other in later on.")
  b) Attempt to draw Jamie's attention to the problem indirectly by acting independently of her
    i) Go to the library to study
    ii) Go to meals without her
 	
3) Seek and/or suggest higher authority assistance for Jamie
  a) Residence Advisor
  b) College counselor
  c) Psychologist
  d) Dean.
  e) Jamie's parents
 	
4) If the situation doesn't change or gets worse remove yourself by moving out or requesting another roommate.
	1. The response does not contain a COA in the expert summary or answer the question (e.g., *"I would not single out the problem, I would just wait and see what happens. Chances are she is just trying to enjoy college as much as possible."*)
	
	2. The response contains only one COA mentioned by the experts **OR** several COA's that do not correspond to the experts' sequence (e.g., *"Possibly report her to security so they would issue an alcohol citation. Possibly talk to her parents/family/friends about her. Show an active interest in her well-being."*)
	
	3. The response contains one type of COA mentioned by the experts and covers several different sub-categories under that COA, reflecting more detailed understanding of the steps to take.
	
	4. The response provides 2 types of COA's mentioned by the experts in the *correct sequence* (e.g., *"I would talk to her and explain that I am really worried about her. If this didn't work, I'd speak to her parents about the matter."*)
	
	5. The response provides 3-4 types of COA's mentioned by the experts that are generally in the correct sequence, e.g., *"I would sit her down and explain to her that first I am her friend and I love her to death. That I am here for her when she needs me. I will be on her side not matter what. But I feel she needs help and I am here to help her study more and party less and not to flunk out. Or I would send her to a psychologist."*

Question 3: Thoughtfulness "To resolve the problems in this situation effectively, please describe in detail what actions you would take?"

Ratings for this section assess the extent to which the responses reflect an understanding of the relationship between one's actions and the potential outcome(s) of these actions. A high score should be assigned to responses that address one aspect of the scenario in terms of how particular actions may result in particular outcomes. Responses should address a relevant sequence of action and action outcomes or reactions. Below is a summary of expert responses and rating scale guidelines including *examples*.

Note: It may be tempting to assign a high rating to a response that addresses multiple aspects of the scenario in a general way. Please avoid doing this!

Five-Point Rating Scale Guidelines:

1.   The response is simple and does not link action to outcome, (e.g., *"I would say I can't look after you all the time. You need to get your act together. But I wouldn't be that worried in the first place"*).

2.   There is suggestion of an action-outcome linkage, but it is superficial, (e.g., *"I would not take it upon myself to help her. I won't let her take me down too. I will do well in school even if it means that I don't spend time to help her"*).

3.   The response discusses an important but general action-outcome linkage, (e.g., *"I would sit her down, schedule out an hour or two, and just ask her what the hell is going on. Talk things through. Establish the problem"*).

4.   The response discusses more than one important and specific action-outcome linkage associated with a specific problem. It begins a sequence and is specific,
         e.g., *"I would first try to talk to my roommate nicely, but if nothing changes, I would firmly tell her that her behavior is extremely distracting and that something must be done because I cannot afford to lose sleep and baby-sit her."*

5.   The response produces a complex and coherent sequence of actions and outcomes to a specific problem. It is as if the respondent is actually putting himself/herself in the situation and can picture how the situation might unfold,
         e.g., *"To resolve the situation, I would start by telling Jamie that I care for her but that her behavior is having a negative impact on me and is unacceptable. I would tell Jamie that she can talk to me about her problems, but if the problems are so big that she cannot solve them on her own, she should see a counselor."*

Question 4 "To resolve this situation effectively, what would you be sure NOT to do?"
This question is rated on a five-point scale that considers the extent to which the responses capture the knowledge conveyed in expert responses, which is summarized below. Basically, the more concepts on the expert list that are captured in the response, the higher the score.

Expert Response Summary	Five-Point Rating Scale Guidelines

1. When speaking to her
    a. Timing is important
        i. Don't start out by suggesting counseling or threatening to move out.
    b. Approach is important.
        i. Don't get angry or accusatory.
        ii. Avoid fighting.
2. Contacting others about the problem
    a. Don't gossip about her problems.
    b. Don't go to an authority figure before letting Jamie know.
3. Managing your involvement
    a. Don't enable Jamie further by joining her when she parties and drinks.
    b. Don't become too emotional or overly involved with Jamie's situation.
4. Do not ignore Jamie or the situation
	1. Response indicates a problem or comment that is <u>not included</u> in the expert summary or does not answer the question, (e.g., "*Get her to hate me for stupid reasons. But she can hate more all she wants if it's because I made her and I study and do good on exams, it's ok*").
	2. Response covers one of the concepts listed by the experts, (e.g., "*Ignore it, it would just get worse*").
	3. Response covers two of the concepts listed by the experts,
	    (e.g., "*What you shouldn't do is let it go. You should at least try and help your roommate out. Another thing would be not to get angry and yell at your roommate—you are just making the problems worse*").
	4. Response covers three of the concepts listed above,
	    e.g., "*I definitely would not be confrontational with Jamie, that sounds like the last thing she needs. I would try not to avoid her though either. I would not nag at her about work, since that isn't going to better anything.*"
	5. Response covers four or more of the concepts listed by the experts,
	    e.g., "*I wouldn't ignore Jamie or make the problem worse by being mad at her because it would add another stress to worry about. I wouldn't encourage her change in attitude from her previous self because it is messing up her academics. I wouldn't stop being there for her when she is drunk, but would try to explain I can't be doing that all the time.*"

Question 5 "What specific outcomes do you hope will result from the course of action you have chosen?"

This rating scale measures the extent to which the participant's expected outcomes overlap with the expert responses. The summary of responses is organized into 4 general "categories" of expected outcomes mentioned by the experts. The general expected outcomes highlighted in **bold** are the most relevant. The non-bold expected outcomes (the "subcategories") are important, but only partially correct.

Expert Response Summary	Five-Point Rating Scale Guidelines

1. **Jamie will open up to you**
   a) Recognize the problem
   b) Recognize its impact on you
2. **Jamie will change her behavior**
   a) She will drink less
   b) She will come to class more
   c) She will be a better roommate
   d) Get good grades
3. **I will be less distracted**
   a) Get more sleep
   b) Study more
   c) Get good grades
4. **The friendship will be restored.**
   a) Study together
   b) Party together
	1. Response does not include an outcome in the expert summary, but may contain a subcategory (e.g., *"She will drink less"*).
	2. Response contains one **major** outcome in the expert summary but does not provide any additional subcategory information (e.g., *"Jamie will open up to you"*).
	3. Response contains one **major** outcome category and subcategories that more fully capture the concept.
	   e.g., *"Jamie will calm down and take her actions elsewhere. She will realize how she is harming her good friend/roomie. She might also realize that she needs to shape up for herself and not just her roomie."*
	4. Response provides <u>more than one</u> **major** category indicated in the expert summary, provides little or no subcategory information.
	   e.g. *"I hope that if we can open up and talk to each other that both our concerns can be addressed and we can work together to find a solution that works for both of us."*
	5. Response provides more than one **major** category of outcomes and includes subcategory information that more fully captures the concept.
	   e.g., *"I hope that Jamie will resolve whatever problems she is having and pay more attention to her schoolwork and not party so much. I would want to see her happier and more considerate o me-like when try to do homework or go to sleep. I would hope that we would become closer as friends-the way we were when we first met."*

51

Question 6 "What obstacles, if any, do you anticipate when obtaining these outcomes?"

This rating scale measures the extent to which the participant's expected obstacles overlap with the expert responses. The summary of responses is organized into 5 general "categories" of expected obstacles mentioned by the experts. The major expected obstacles highlighted in **bold** are the most relevant. The non-bold expected obstacles (the "subcategories") are important, but only partially correct.

Expert Summary	Five-Point Rating Scale Guidelines

1. **Talking about it won't work**
  a. Jamie won't be receptive/willing to talk
  b. She may not follow through on agreed upon arrangements.
2. **Talking about it could make it worse**
  a. Jamie will become angry with me.
  b. She may guilt trip me.
  c. Talking with precipitate an outpouring of emotion that overwhelms you both.
  d. If you talk to her and she doesn't change you may become more frustrated, less understanding and more stressed.
  e. The friendship will fall apart.
3. **Jamie will be resistant and unwilling to change**
4. **Jamie may already be out of control and unable to change**
5. **Poor overall academic performances.**
  a. Poor midterm exam performance.
	1. Response lists no obstacles, obstacles not indicated by the experts, or is not answering the question (e.g., *"Trying to get your friend back to normal again. Have everything settled between the two"*).
	2. Response vaguely addresses one of the five **major** obstacles in the expert summary, or lists a subcategory (e.g., *"Her self-esteem problems"*).
	3. Response addresses one of the **major** obstacles more fully, including its subcategories (e.g., *"Lots of resistance, maybe even some hostility directed at you. She may also want to try to avoid you as much as possible"*).
	4. The response addresses <u>more than one</u> **major** obstacle (e.g, *"Her resistance to change. A more solid block between us"*).
	5. Response addresses more than one **major** obstacle, and fully captures them by including subcategory information, e.g., *"If she doesn't realize that she's doing anything wrong, she may have trouble stopping her actions. Her mood may be depression, getting her to open up could be hard. Therapy may be good. Listen to her talk without being judgmental. Getting her to admit that she's acting different. Hostility/Resentment towards you."*

College Life Scenarios: Guidelines for Scoring

Introduction

The English Class Scenario is made up of six open-ended questions designed to assess experience-based (tacit) knowledge in college life. In a nutshell, we need to assess the extent to which responses reflect knowledge that experienced college students may have acquired in college life. We have collected data from college life "experts," i.e. college seniors/graduates, for comparison purposes.

Your job is to rate responses to these open-ended questions on a five-point scale. Below you will find detailed guidelines for scoring each question. Questions one and three involve rating on two broad dimensions, content and thoughtfulness. Questions two, four, five and six are rated based on the content dimension only.

Please review the attached English Class Scenario followed by the open-ended questions that the respondents answered. Then read the scoring guideline for each question fully before you begin to rate the responses.

Feel free to contact us should you have any difficulties or questions. Cynthia Matthew can be reached at Cynthia.matthew@yale.edu or (436-1544), and Cassandra Nichols at Cassandra.Nichols@yale.edu or (432-3858).

Thank you and have fun!

Important Tips for Rating this Scenario:

1) It is essential that you review the expert responses carefully, including their major categories and subcategories.
2) Use your judgment when a response contains examples that are not found in the expert responses. If you still feel that it deserves a high score, please feel free to rate it as such. Just remember to always be consistent with your ratings.
3) There will be responses that you might not feel are deserving of content-related high score (particularly in questions 4, 5 and 6), but the rating scale states that they must be rated highly. We believe that the thoughtfulness scales for questions 1 and 3 will compensate for this, so please be consistent with the five-point scale guidelines.
4) The writing can be poor and confusing at times. Please try to infer as best as you can.

Scoring Guide: English Class Scenario

Question 1: Content   "What problems need to be addressed in this situation?"

This question is rated on a five-point scale that considers the extent to which the responses capture the knowledge conveyed in expert responses, which is summarized below. Basically, the more the response suggests problems associated with the major problems areas on the expert list, the higher the score. Below is a summary of expert responses and rating scale guidelines including *examples*.

Expert Response Summary	Five Point Rating Scale Guidelines

1. My individual performance in the class:
   a) My work may not be good enough. I may need to make improvements.
   b) I need more information about Dr. Asher's expectations and his assessment of my work to understand why putting in more effort did not improve my grade.
 	
2. How to do well in the group project
   a) How to include Ron in the group project.
   b) How to deal with the quality of Ron's work.
   c) How to incorporate Ron's work in the group project without compromising quality.
   d) Improving your working relationship with Ron. He may have complained to Dr. Asher.
3. Dr. Asher's grading policies are not clear.
   a) Dr. Asher is not responsive or helpful.
4. Dr. Asher's grading policies may not be fair.
   a) Dr. Asher may be playing favorites.
	1. Response indicates a problem or comment that is not included in the expert summary, or is not relevant in your judgment (e.g., "When are we going to find time to do this?").
	
	2. Response vaguely covers one of the major problem areas, or vaguely covers a problem relevant in your judgment, (e.g., "Address Ron and tell him to put more effort into the assignment").
	
	3. Response suggests clear and specific problems associated with one of the major problem areas listed, or a major problem you feel is relevant, (e.g., "The problems not being addressed are: Ron working with his group more frequently and also communication in the group").
	
	4. Response suggests problems associated with two of the major problem areas listed, or two problems relevant in your judgment, (e.g., "Why Dr. Asher seems to like Ron more than the other students. Catherine and I should work with Ron instead of dismissing his ideas").
	
	5. Response suggests problems associated with three or more of the major problems areas listed, or three or more problems areas relevant in your judgment (e.g., "Why am I doing poorly on my part? Is Dr. Asher really favoring some students? How can I tell Ron his work needs a little improvement?").

Question 1: Thoughtfulness   "What problems need to be addressed in this situation?"

This five-point rating scale assesses the extent to which the response reflects insight into the problems. In other words, ratings should be based on the extent to which the response reflects knowledge of possible underlying factors that may have given rise to the problem, and/or the future consequences if the problem is not addressed. Below are rating scale guidelines including examples.

5-point rating scale guidelines:

1. Response does not suggest any insight.
   a. It does not ask why the problem may exist or consider possible consequences that may result.
   b. It is completely off topic.
   c. It merely provides a recitation of the problems listed in the scenario.
   (e.g., "The teacher's grading. Ron's attitude and connection with Dr. Asher.")

2. Response suggests insight but focuses on a superficial or tangential aspect of the problem.
   (e.g., "Ron doesn't do any work and I keep getting C+'s on my papers. C's don't bother me but to get them all the time can be kind of annoying.")

3. Response demonstrates insight into problems that are central to the situation but stated rather generally. It does not suggest specific reasons or consequences.
   (e.g., "Why am I not receiving higher grades on my papers? How can we include Ron in the project? How can I try to become more friendly with Mr. Asher?")

4. Response demonstrates insight into problems that are central to the situation <u>and</u> suggests relevant underlying problems <u>or</u> potential consequences.
   (e.g., "It needs to be addressed that we are not working as a group and we need to be and that we need to come up with some plan on how we're going to make everyone's pieces fit together.")

5. Response demonstrates insight into the problems that are central to the situation suggests and includes statements about relevant underlying problems, possible consequences of the problem if they are not addressed, <u>and</u> how a solution might be found.
   (e.g., "Ron needs to understand that while his ideas make sense to him, they are confusing to the other group members; and they don't go along with the work of the other 2 people. He needs to be convinced that the 3 people need to compromise. Catherine and I should apologize for working without him and say that we really need to figure out a way that everyone can work on the project and come out OK; maybe incorporating more of Ron's ideas if he can explain them better.")

Question 2: Content   "What is the single most important problem?"

This rating scale is based on the extent to which the response captures expert responses in terms of content and specificity. Expert responses are broken down into: major problem areas and related subcategories, which are specific examples of the broader category (in bold type); and less significant problem areas, and related subcategories (not in bold type).

Expert Response Summary	Five-point rating scale guidelines

1. How to get a better grade on individual work
  a. How to obtain more information about Dr. Asher's expectations and his assessment of your work.
     i. How to elicit constructive input on your work from Dr. Asher.
     ii. Understand the discrepancy between the amount of work you are putting in and your grades.
2. How to get a good grade on the group project.
  a. How to include Ron's work in a productive way.
  b. Ron is not contributing enough.
  c. How to repair the group dynamic.
3. The possibility that Dr. Asher may grade unfairly.
  a. He may favor Ron.
  b. He may favor previous versus new students.
  c. He may play favorites.
4. Communication gap
  a. How to more effectively communicate with Prof. Asher.
  b. How to effectively communicate with group members.
	1. Response focuses on a problem that does not appear in the expert summary, is not relevant in your judgment, or does not answer the question, (e.g., "Finish project").
	
	2. Response selects a sub-category which is included in the expert summary but is not a major subcategory, and, therefore, <u>not in bold type</u>, (e.g., "That you are not getting along as a team").
	
	3. Response indicates **one of the major categories** listed above <u>in bold</u> type but very generally stated, i.e. without subcategory information, (e.g., "How can I do better in the class?").
	
	4. The response indicates **one of the major categories** and any additional subcategory information that suggests a more developed understanding of the major problem area.
	e.g., "My grade is the most important problem. If I was doing everything I could and still receiving a C+ I would want to know why."
	
	5. The response **integrates more than one major category** and suggests a developed understanding of how problem areas are linked.
	e.g., "The teacher is reinforcing Ron's lackadaisical work effort, and Ron is responding to hurt the group project. Because it is not only affecting the grade but it is making my effort and work seem less important than just being a favorite."

Question 3: Content   "To resolve the problems in this situation effectively, please describe in detail what actions you would take."

The five-point rating scale assesses the extent to which the participant's course of action (COA) contains the major areas suggested by the experts in terms of content only. The summary of expert responses has been organized into 4 general "types" of COA's. Ratings are simply based on the number of types of COA's suggested by the response. **Please use your judgment; if a response contains an example that is not mentioned in the expert summary, but in your view is representative of a major category, rate it as such.**

Expert Response Summary	5-point rating scale guidelines

1. Discuss your concerns about your paper grades with Dr. Asher.
   a) Schedule a meeting with Dr. Asher and explain your concerns in detail.
   b) Ask him to provide more specific feedback to help you understand how to improve your papers.
2. Talk to Catherine about your concerns about your paper grades and group project.
   a) Discuss how you can include Ron's work in the project.
   b) Ask her if you can read her paper.
3. Take steps to improve working together as a group.
   a) Talk to Catherine.
   b) Talk to Ron.
   c) Take it up jointly as a group.
   d) Ask for Prof. Asher's help.
   e) Make an effort to engage Ron
      1. Apologize for dismissing his ideas
      2. Make him feel welcome.
      3. Appease him
   f) Ask for Ron's help
      1. Ask for his input on paper grades.
      2. Let him know how important it is for you to get a good grade on this project.
   g) Work on producing a quality group project.
      1. Explain your concerns about Ron's ideas.
      2. Explain your ideas to Ron and convince him of their value.
      3. Edit Ron's work
4. Seek the help of an outside official.
   a) Seek the advice of a former English professor.
	1. Response does not contain a COA in the expert summary, contains a COA that is not relevant in your judgment, or does not answer the question (e.g., "Knowing that Ron always gets good grades and is well-liked by the teachers, I would do the project however he said it should be done").
	
	2. Response vaguely addresses one type of COA listed on the expert summary, or vaguely addresses one COA relevant in your judgment, (e.g., "I would sit down and discuss the problems with the group then act accordingly").
	
	3. Response clearly and in greater detail addresses one type of COA listed by the experts, or one COA that is relevant in your judgment. e.g., "Discuss different sections of the project. Try to help Ron with his section so it works together with the rest of the project, and try to get Ron to take his work seriously."
	
	4. Response suggests 2 types of COA's listed by the experts, or 2 COA's relevant in your judgment. e.g., "I would talk to Ron and tell him that he needs to put more of an effort in. If I continued to get bad grades I would have to go to someone higher up in the department and ask for their advice."
	
	5. Response provides 3 or more types of COA's listed by the experts, or 3 or more COA's relevant in your judgment. e.g., "I would make an appointment with Dr. Asher before I met with the group. I would find out exactly what was wrong with my paper. Then I would meet with my group because that is a separate situation and handle things responsibly with them. Then I would make another appointment with the writing center for more help

b) Ask the head of the writing department to grade the paper. c) Complain to the Head of the Department or Dean of Students. d) Visit the Writing Center for more assistance.	on how to fix my paper."

Question 3: Thoughtfulness   "To resolve the problems in this situation effectively, please describe in detail what actions you would take?"

Ratings for this section assess the extent to which the responses reflect insight into the relationship between one's actions and the potential impact of them on the problems in the scenario (i.e., action and action-outcome). A high score should be assigned to responses that suggest an action sequence that addresses important aspects of the problem situation. Bear in mind the number of aspects addressed is not important. What is important is the thoughtfulness that can be inferred from the response.

Note: It might be tempting to assign a high rating to a response that addresses multiple aspects of the scenario in a general way. Please avoid doing this!

Five-Point Rating Scale Guidelines:

1. Response is simple, does not show any insight into the relationship between actions and their impact or outcomes on the problem, or just doesn't answer the question, (e.g., "I would tell Catherine and Ron that the project is all of ours and not everyone is doing their work").

2. Response reflects insight into the relationship between action and potential action-outcomes, but applied to a superficial aspect of the problem situation,
      e.g., "I would talk to my professor and tell him that Ron is not putting in the effort like everyone else. I would also say I wrote his paper. And how I deserve a better grade like Ron's because I write the same way. I deserve a B+."

3. Response reflects insight into the relationship between action and action-outcomes of an important aspect of the problem situation <u>stated generally</u>, (e.g., "I would talk to Ron and Catherine and hope that we could reach some conclusion on how to make this project work. Also how we're going to work as a group").

4. Response reflects insight into the relationship between action and action-outcomes of important aspects of the problem <u>in greater detail</u>. It begins a sequence and is specific,
      e.g., "I would first attempt to discuss my feelings regarding his grading policy with the professor, highlighting the main reasons I feel it is unfair. If nothing changed, I would try to find other students who agreed with me and take it to the administration."

5. Response produces a complex and coherent sequence of actions and outcomes to important aspects of the problem situation. It is as if the respondent is actually putting himself/herself in the situation and can picture how it might unfold,
      e.g., "Instead of dividing up the work on the project, do it as a group, with all three members working together. That way you can weed out a lot of Ron's bad ideas while still including him on the project. With the papers, go to the professor with your last paper and go over with him how you could have done better."

Question 4 "To resolve this situation effectively, what would you be sure NOT to do?"

This question is rated on a five-point scale that considers the extent to which the responses capture the knowledge conveyed in expert responses, which is summarized below. Basically, the more concepts on the expert list that are suggested in the response, the higher the score. *Bear in mind that the response may not use the term (s) "Don't" or "Do Not" in responses about "what not to do".*

Expert Response Summary	Five-Point Rating Scale Guidelines

1. Do not anger Professor Asher.
  a. Approach him in a non-confrontational manner.
  b. Do not accuse him of favoritism (unless you are absolutely sure and as a last resort.)
  c. Do not go to the Dean of Students or another official right away. Do this only when all other avenues for resolving the problem are exhausted.
2. Do not anger or upset Ron.
  a. Do not say he is one of Dr. Asher's favorites.
  b. Do not say that his work is sloppy and yours is better.
  c. Do not explicitly ask him if he spoke to Dr. Asher.
3. Do not let yourself get too angry with anyone involved including yourself.
4. Do not mismanage the project
  a. Do not continue to exclude Ron on the group project.
  b. Do not take complete control of group project.
  c. Do not give Ron complete freedom on the project.
5. Do not ignore the problems
  a. Problems associated grades on your written work.
  b. Problems associated with group project.
	1. Response indicates a problem or comment that is <u>not included</u> in the expert summary, is not relevant in your judgment, or does not answer the question, (e.g., "Not to put it off until the day before").
	
	2. Response <u>vaguely covers one</u> of the concepts listed, or one concept relevant in your judgment, (e.g., "I would not make Ron feel out-casted").
	
	3. Response covers <u>in greater detail one</u> of the concepts listed, or one concept relevant in your judgment.
	e.g., "I wouldn't come out and say I know why Ron received this grade. I also wouldn't say it was because he was one of his favorites. I wouldn't accuse him of giving a better grade based on favorites."
	
	4. Response covers <u>two</u> of the concepts listed, or two concepts relevant in your judgment, (e.g., "Make the teacher mad by accusing him of being biased. And also no accusing Ron, but be sincere about it").
	
	5. Response covers <u>three or more</u> of the concepts listed, or three or more concepts relevant in your judgment,
	e.g., "Accuse Ron of being lazy or trying to slide through class because he already knows Dr. Asher. Get angry and Dr. Asher and directly accuse him of playing favorites. Continue to work as a group, the same as before. Neglect to look into the English Dept. policies surrounding grading."

Question 5: "What specific outcomes do you hope will result from the course of action you have chosen?"

The five-point rating scale assesses the extent to which the response includes major areas on the expert list in terms of <u>content and specificity</u>. The summary of expert responses has been organized into 4 general "types" of outcomes with multiple subcategories. Ratings are simply based on the number of types suggested in the response and the degree to which they more fully capture the concept by including subcategory information.

Expert Response Summary	Five-Point Rating Scale Guidelines

1. Talking with Dr. Asher will be effective.
   a) You will gain greater understanding of the expectations.
   b) Dr. Asher will provide constructive criticism of your work
   c) Dr. Asher will recognize your efforts and commitment to excel.
   d) Dr. Asher will accept that you don't think the grade is fair, and will negotiate a fairer grade with you.
 	
2. Taking steps to include Ron in the group project will yield positive results.
   a) Ron will be cooperative.
   b) You will achieve a compromise that involves everyone's involvement.
   c) A group project in which all members feel satisfied.
   d) Your group will obtain a good grade on the project.
   e) Ron will recognize the value of your & Catherine's work on the project.
 	
3. Seeking outside help will be beneficial.
   a) You will gain an understanding of Dr. Asher's behavior and get advice.
   b) If you need to go to a higher authority, she or he will resolve the problem.
 	
4. You will gain personally from the experience
   a) Obtain a good individual grade.
   b) Learn from Catherine & Ron.
   c) Become a better writer.
	1. Response does not include an outcome in the expert summary, it is not relevant, or it does not answer the question, (e.g., "Switching classes").
	
	2. Response contains <u>one</u> outcome in the expert summary, or one outcome relevant in your judgment, <u>stated generally</u>, (e.g., "I will learn how to work better with people").
	
	3. Response provides at least <u>one</u> outcome in the expert summary, or one relevant in your judgment, that <u>includes subcategories</u> and more fully captures the concept, (e.g., "Hopefully, he will reevaluate my writing and I will receive a better grade, or he will give me guidance with my future papers").
	
	4. Response contains <u>two</u> outcomes in the expert summary, or two outcomes relevant in your judgment, <u>stated generally</u>, (e.g., "Hopefully the professor will ease my essay scores, and we'll get a good grade on the project").
	
	5. Response provides <u>two</u> outcomes in the expert summary, or two outcomes relevant in your judgment, that <u>include subcategory information,</u> more fully capturing the concept.
	e.g., "I hope the professor would realize if he's being unfair and I would hope he would realize that Ron is not putting much effort into the project. I would hope I would gain a better understanding of what the professor expects from my work in order to ameliorate my future assignments. I would hope Ron would realize that he needs to make as much of an effort as I am and that we would get a better grade."

Question 6   "What obstacles, if any, do you anticipate when obtaining these outcomes?"

The five-point rating scale assesses the extent to which the response includes major areas on the expert list in terms of <u>content and specificity</u>. Expert responses are grouped into 4 general "types" of outcomes with more specific subcategories. Ratings are simply based on the number of types suggested in the response and the degree to which the response is clear, specific and reflects a more developed understanding of the nature of the obstacle.

<u>Expert Summary</u>	<u>Five-Point Rating Scale Guidelines</u>

1. Speaking to Dr. Asher won't help.
     a. He will not provide you with information to help you understand his requirements and how to improve your writing
     b. He may not be willing to negotiate your grade.
     c. He may be unfair in his grading practices.
 2. Ron will not be responsive to your efforts to include him.
     a. He may be angry and resistant to working together.
     b. He may not accept your ideas for the project.
     c. It will be difficult to find a compromise that doesn't anger Ron.
     d. He may continue to feel excluded and possibly talk to Dr. Asher
     e. The burden of the work for the group project will continue to fall on you and Catherine.
     f. You may become angry with Ron and do or say the wrong thing.
 3. You and Catherine may not agree on how to approach the situation, which could result in additional strained relations.
 4. Including Ron's work in the group project may make comprise the quality of work.
 5. Seeking help from outside or a higher authority will not be beneficial.
	1. Response lists no obstacles, irrelevant obstacles, obstacles not indicated by the experts, or is not answering the question (e.g., "I wouldn't anticipate any outcomes. It is what it is").
	
	 2. Response <u>vaguely addresses one</u> of the five obstacles listed, or vaguely addresses one obstacle relevant in your judgment (e.g., "Dr. Asher may not provide the information I am looking for").
	
	 3. Response addresses <u>one</u> of the obstacles listed in the expert summary (or one relevant in your judgment) clearly and more specifically reflecting a <u>more developed response.</u>
	 e.g., "Dealing with Ron. I would have to deal with him rejecting our ideas and only liking his own. I would also have to be especially nice to him so he doesn't tattle to the professor again."
	
	 4. The response <u>vaguely addresses two</u> obstacles listed, or two obstacles you find relevant.
	 e.g, "If Ron spoke to Dr. Asher, then Dr. Asher might be predisposed to not give us a good grade on the project. That Ron will not do his part with respect to completing the project").
	
	 5. Response addresses <u>two or more</u> obstacles listed more clearly and specifically reflecting a <u>more developed response,</u>
	 e.g., "It might be hard to get Ron to work cooperatively with us again, considering he obviously told Dr. Asher he was excluded (unless the same thing is happening in another group too). Dr. Asher might not be willing to tell me what I need to get a better grade on my papers. And he might be defensive if I say I feel I deserved a higher grade."

Appendix F1. Sample reflection interventions: Reflection on Condition

<p style="text-align:center">Improving Problem Solving Skills (Battalion Commander)</p>

In this brief exercise, we would like to turn your attention to how you come to understand the leadership problems you face on the job. You will read questions about the leadership problems you encountered in the vignettes and case study, and also about problems you have encountered in your work. These questions may seem abstract, so they are explained below. The first two questions are:

"What is the problem that must be solved? What goal do you intend to reach by solving it?"

In these questions we are asking you to differentiate between a <u>problem</u> and a <u>goal</u>. A <u>problem</u> is a conflict that must be resolved, a challenge that must be overcome, or a balance that must be achieved in order to accomplish a particular <u>goal</u>. Using terms from the FM 101-5, a goal is analogous to a "mission" in that stating a goal involves stating the purpose for action. A problem is analogous to a "key task" in that problems represent the conditions that must be met for mission success or goal accomplishment. So, when we ask you to identify the problem in a vignette or case study, we are not asking you to provide us with a goal. We are asking you to *state your goal* and to *identify what difficult thing must be accomplished* in order to meet that goal.

Consider the example below. What is the problem that must be solved in this situation?

You are a battalion commander and it is the end of your first battle at a major externally-evaluated training exercise, during which your unit revealed some major shortcomings. During the AAR, the Chief Evaluator is highly critical of the battalion and dwells on all the negative things your unit did that day. You carefully record all of the negative observations, but you know full well that the battalion also did some very positive things that day. What should you do?

Your <u>goal</u> in this situation might be to make sure that the Chief Evaluator recognizes the positive things your battalion did in the training exercise. In this case, the <u>problem</u> that must be solved is to find a way to assert yourself with the Chief Evaluator without undermining your credibility.

An alternative <u>goal</u> might be to improve your battalion's performance in future training exercises. In this case, the <u>problem</u> that must be solved is to establish and implement a set of methods that will lead to increased unit effectiveness and readiness.

<p style="text-align:center">Another question you will see often is the following:</p>

"Describe the factors you considered when choosing your goal and determining the problem that must be solved (e.g., doctrine, personal values, assumptions about army culture, procedures, and personnel, knowledge based on previous experiences)"

By asking you to describe the factors listed above, we are trying to get you thinking about how you determine your goals and identify which problems to solve on the job. There are multiple ways to decide on goals and identify the critical problems to solve. These ways differ in how effectively they lead to a problem solution. By understanding how you choose a particular goal and how you come to

identify the problems you face, you can better understand why you take the actions you do, and perhaps improve the effectiveness of your problem solving.

Using the example above, if you defined the problem as one of asserting yourself with the Chief Evaluator, you might describe the factors as follows:

"I assumed that the Chief Evaluator's on-sided evaluation would have a negative effect on unit morale. I know from past experience that bad morale undermines unit cohesion and leadership capability. Also, I assumed that by asserting myself I would show my unit that I recognize their strengths. This would also improve morale."

If you defined the problem as one of establishing and implementing methods for increasing unit effectiveness and readiness, you might describe the factors as follows:

"I assumed that the Chief Evaluator just had a negative style and that my unit would not take the on-sidedness of the evaluation too seriously. I have learned from past experience that you learn a lot more from hearing about your mistakes than from hearing praise. Evaluations are not about building self-esteem."

We understand that you did not necessarily think this analytically when you examined the vignettes and case study earlier in today's session. Much of this kind of thinking is automatic and outside of our awareness. However, just as a golfer or baseball player must examine his swing in detail in order to improve it, we suspect that a leader must examine his reasons and thinking behind problem solving in order to improve his decision-making capability.

On the following page, you will encounter the questions described above and you will be asked to think about, well, how you think. Please answer these questions thoughtfully and thoroughly, using the digital recorders. You will have approximately 40 minutes to complete the exercise. If at any point during this exercise you have questions about what we are asking you to do, please raise your hand and someone will assist you.

Think about the first vignette you read (reprinted below).

B3. You are a new battalion commander and one of your most important and challenging tasks is to establish the training priorities for your unit. While everything looks important and you would like to meet every possible contingency, you also realize that you do not have the time or resources to "do it all."

COG-1a) What is the problem that must be solved in this vignette?
COG-1b) What goal do you intend to reach by solving it?

COG-2) Describe the factors you considered when choosing your goal and determining the problem that must be solved. (e.g., doctrine, personal values, assumptions about army culture, procedures, and personnel, knowledge based on previous experiences)

COG-3a) What is an alternative goal you could have?

COG-3b) What problem must be solved if you wish to reach this goal?

COG-4) Describe the factors that played a role in choosing this goal and determining the problem you just described.

COG-5) Imagine that your goal is to increase the amount of training resources available to you. One problem that must be solved is determining a strategy for re-allocating existing resources to meet the current training needs. Describe the factors that would play a role in choosing this goal and determining problem identification.

Think about the leadership problems in the case study you read.
(You may flip back to it to review your answers, if necessary.)

COG-6) Describe the factors you considered when you chose your goal and identified the *most important problem* in the case study. (e.g., doctrine, personal values, assumptions about army culture, procedures, and personnel, knowledge based on previous experiences)

COG-7) Imagine you had identified one of the secondary problems as the main problem. What goal would you accomplish by solving this problem as if it was the most critical?

COG-8) Describe the factors that would play a role in choosing this goal and determining this problem identification.

Think about a leadership problem that challenged you to re-examine your goals and assumptions.

COG-9) Briefly describe the problem situation. What was your initial goal, and the problem you had to solve to achieve it?

COG-10) Describe the factors that played a role in choosing your goal and determining your problem identification.

COG-11) Why didn't your initial understanding of the problem result in effective action?

COG-12) What factors did you have to consider to change your understanding of the problem?

Appendix F2. Sample reflection interventions: Reflection on Action

Improving Problem Solving Skills (Battalion Commander)

In this brief exercise, we would like to demonstrate how reflecting on the unexpected outcomes of our actions can provide information that improves our problem-solving capability. On the next few pages, you will be presented with the answers that other military personnel gave to one of the vignettes and the case study you just completed. You will be asked to reflect on the differences between your answers and the answers provided by others and to reflect on how these differences might have come about.

One way to reflect on how differences in actions come about is to ask questions about where a person's decisions to act come from. As you well know, different people can encounter the same situation but interpret it very differently. These different people therefore act very differently. With the questions we ask in this exercise, we are trying to turn your attention to how you come to understand the leadership problems you face on the job and how your understanding affects your decision to act. These questions may seem abstract, so they are explained below. The first two questions are:

"What is the problem that must be solved? What goal do you intend to reach by solving it?"

In these questions we are asking you to differentiate between a <u>problem</u> and a <u>goal</u>. A <u>problem</u> is a conflict that must be resolved, a challenge that must be overcome, or a balance that must be achieved in order to accomplish a particular <u>goal</u>. Using terms from the FM 101-5, a goal is analogous to a "mission" in that stating a goal involves stating the purpose for action. A problem is analogous to a "key task" in that problems represent the conditions that must be met for mission success or goal accomplishment. So, when we ask you to identify the problem in a vignette or case study, we are not asking you to provide us with a goal. We are asking you to state your goal and to identify what difficult thing must be accomplished in order to meet that goal.

Consider the example below. What is the problem that must be solved in this situation?

You are a battalion commander and it is the end of your first battle at a major externally-evaluated training exercise, during which your unit revealed some major shortcomings. During the AAR, the Chief Evaluator is highly critical of the battalion and dwells on all the negative things your unit did that day. You carefully record all of the negative observations, but you know full well that the battalion also did some very positive things that day. What should you do?

Your <u>goal</u> in this situation might be to make sure that the Chief Evaluator recognizes the positive things your battalion did in the training exercise. In this case, the <u>problem</u> that must be solved is to find a way to assert yourself with the Chief Evaluator without undermining your credibility.

An alternative <u>goal</u> might be to improve your battalion's performance in future training exercises. In this case, the <u>problem</u> that must be solved is to establish and implement a set of methods that will lead to increased unit effectiveness and readiness.

Another way to reflect on how differences in actions come about is to ask questions about how different actions result in different outcomes. As you well know, different people can have similar interpretations of a situation and yet take very different actions to handle it. You will also be asked questions about the actions you chose versus those of the other military personnel, and what outcomes you would expect to result from these actions. We are interested in specific answers to these questions, as opposed to something like "I would reach my goal."

We understand that you did not necessarily think this analytically when you examined the vignettes and case study earlier in today's session. Much of this kind of thinking is automatic and outside of our awareness. However, just as a golfer or baseball player must examine his swing in detail in order to improve it, we suspect that a leader must examine his reasons and thinking behind problem solving in order to improve his decision-making capability.

On the following three pages, you will encounter the questions described above and you will be asked to reflect on how having different goals and identifying different problems lead to different problem-solving strategies. Please answer these questions thoughtfully and thoroughly, using the digital recorders. You will have approximately 40 minutes to complete the exercise. If at any point during this exercise you have questions about what we are asking you to do, please raise your hand and someone will assist you.

Think about the first vignette you read.
It is reprinted below with the average ratings given by 59 AWC students designated as expert battalion commanders.

B3. You are a new battalion commander and one of your most important and challenging tasks is to establish the training priorities for your unit. While everything looks important and you would like to meet every possible contingency, you also realize that you do not have the time or resources to "do it all." Rate the following strategies for how effective they would be in helping you establish your priorities.

__8__ Study the brigade's training schedule.

__8__ Talk to the brigade S-2, S-3, and CSM to verify your understanding of the brigade commander's training focus.

__7__ Schedule meetings to discuss training with each of your staff members during your first week of command.

__8__ Explain your goals and your plans for the battalion very clearly to your officers and staff.

__4__ Assess the tactical and technical competence of your Soldiers individually by giving them formal and informal tests.
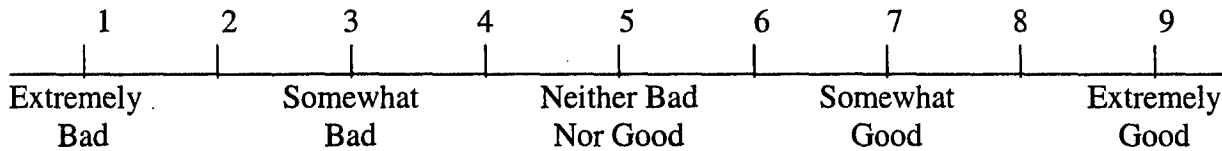
__6__ Rely on the assessments made by the previous battalion commander.

__7__ Select three to five upcoming missions (based on the brigade training plan) to focus your Soldiers' energy on.

__8__ Before doing anything, make sure you understand the commander's intent two levels up.

__8__ Soon after taking command, visit each staff section's shop and get a full briefing on their operations.

__8__ Talk to the brigade commander to determine his training priorities.

1	2	3	4	5	6	7	8	9

Extremely Bad   Somewhat Bad   Neither Bad Nor Good   Somewhat Good   Extremely Good

Note: See Part II for Overview and Instructions on Vignettes

In this vignette, my ratings differed from the AWC students' on the following options (please indicate with a check in the space provided on the left of the option):

___ Study the brigade's training schedule.   _____

___ Talk to the brigade S-2, S-3, and CSM ...   _____

___ Schedule meetings to discuss training ...   _____

___ Explain your goals and your plans ...   _____

___ Assess the tactical and technical competence ...   _____

___ Rely on the assessments made ...   _____

___ Select three to five upcoming missions ...   _____

___ Before doing anything, make sure you understand _____

___ Soon after taking command, visit ...   _____

___ Talk to the brigade commander ...   _____

My ratings differed from the AWC students' ratings in the following ways (Please indicate the degree of difference by writing the appropriate abbreviation to the right of the relevant response option.):

68

(MH) Much higher (5 or more points difference)
(H) Higher (3-4 points difference)
(SH) Slightly higher (1-2 points difference)
(SL) Slightly lower (1-2 points difference)
(L) Lower (3-4 points difference)
(ML) Much lower (5 or more points difference)

My ratings differed from the students' ratings perhaps because we had different goals in mind, and identified a different problem to be solved...

REF-1a) What do you think is the problem that must be solved in this vignette?
REF-1b) What goal do you intend to reach by solving it?

REF-2a) What do you think the AWC students' goal might have been?
REF-2b) What problem do you think they intended to solve?

Perhaps the students and I had similar goals and identified a similar problem, but we preferred different actions...

REF-4) What outcome do you feel your actions would achieve?

REF-5) What outcome do you feel the students' actions would achieve?

Think about the leadership problems in the case study you read.
(You may flip back to it to review your answers, if necessary.)
One of the questions from the case study is reprinted below with the average answer from 23 NCOs.

What COA would you take to solve the problem?

Approach CPT Powers about coming directly to me with his concerns. Call a meeting with PSG Newell and counsel him to "crack the whip" with the squad leaders. Take a direct role in supervising training exercises.

REF-6) How does your COA differ from the one preferred by the NCOs?

REF-7) What problem do you suppose the NCOs identified as most important in order to prefer the COA they did?

REF-8) What outcome do you feel the NCOs COA would achieve?

REF-9) How does the expected outcome of the NCO COA differ from that of your own COA?

Think about a leadership problem that challenged you to re-examine your goals and assumptions, where your actions didn't result in the outcome you expected.

REF-10) Briefly describe the problem situation. What was your initial goal, and the problem you had to solve to achieve it?

REF-11) What outcome did you expect to result from your chosen COA?

REF-11) What outcome actually occurred?

REF-12) What alternative goals and problems did you identify in order to address the situation?

REF-13) What alternative COA did you have to take in order to achieve the desired outcome?

Appendix F3. Sample reflection interventions: Reflection on Condition and Action

Improving Problem Solving Skills (Battalion Commander)

In this brief exercise, we would like to demonstrate how reflecting on the unexpected outcomes of our actions can provide information that improves our problem-solving capability. On the next few pages, you will be presented with the answers that other military personnel gave to one of the vignettes and the case study you just completed. You will be asked to reflect on the differences between your answers and the answers provided by others and to reflect on how these differences might have come about.

One way to reflect on how differences in actions come about is to ask questions about where a person's decisions to act come from. As you well know, different people can encounter the same situation but interpret it very differently. These different people therefore act very differently. With the questions we ask in this exercise, we are trying to turn your attention to how you come to understand the leadership problems you face on the job and how your understanding affects your decision to act. These questions may seem abstract, so they are explained below. The first two questions are:

"What is the problem that must be solved? What goal do you intend to reach by solving it?"

In these questions we are asking you to differentiate between a <u>problem</u> and a <u>goal</u>. A <u>problem</u> is a conflict that must be resolved, a challenge that must be overcome, or a balance that must be achieved in order to accomplish a particular <u>goal</u>. Using terms from the FM 101-5, a goal is analogous to a "mission" in that stating a goal involves stating the purpose for action. A problem is analogous to a "key task" in that problems represent the conditions that must be met for mission success or goal accomplishment. So, when we ask you to identify the problem in a vignette or case study, we are not asking you to provide us with a goal. We are asking you to state your goal and to identify what difficult thing must be accomplished in order to meet that goal.

Consider the example below. What is the problem that must be solved in this situation?

You are a battalion commander and it is the end of your first battle at a major externally-evaluated training exercise, during which your unit revealed some major shortcomings. During the AAR, the Chief Evaluator is highly critical of the battalion and dwells on all the negative things your unit did that day. You carefully record all of the negative observations, but you know full well that the battalion also did some very positive things that day. What should you do?

Your <u>goal</u> in this situation might be to make sure that the Chief Evaluator recognizes the positive things your battalion did in the training exercise. In this case, the <u>problem</u> that must be solved is to find a way to assert yourself with the Chief Evaluator without undermining your credibility.

An alternative <u>goal</u> might be to improve your battalion's performance in future training exercises. In this case, the <u>problem</u> that must be solved is to establish and implement a set of methods that will lead to increased unit effectiveness and readiness.

Another question you will see often is the following:

"Describe the factors you considered when choosing your goal and determining the problem that must be solved (e.g., doctrine, personal values, assumptions about army culture, procedures, and personnel, knowledge based on previous experiences)"

By asking you to describe the factors listed above, we are trying to get you thinking about how you determine your goals and identify which problems to solve on the job. There are multiple ways to decide on goals and identify the critical problems to solve. These ways differ in how effectively they lead to a problem solution. By understanding how you choose a particular goal and how you come to identify the problems you face, you can better understand why you take the actions you do, and perhaps improve the effectiveness of your problem solving.

Using the example above, if you defined the problem as one of asserting yourself with the Chief Evaluator, you might describe the factors as follows:

"I assumed that the Chief Evaluator's on-sided evaluation would have a negative effect on unit morale. I know from past experience that bad morale undermines unit cohesion and leadership capability. Also, I assumed that by asserting myself I would show my unit that I recognize their strengths. This would also improve morale."

If you defined the problem as one of establishing and implementing methods for increasing unit effectiveness and readiness, you might describe the factors as follows:

"I assumed that the Chief Evaluator just had a negative style and that my unit would not take the on-sidedness of the evaluation too seriously. I have learned from past experience that you learn a lot more from hearing about your mistakes than from hearing praise. Evaluations are not about building self-esteem."

We understand that you did not necessarily think this analytically when you examined the vignettes and case study earlier in today's session. Much of this kind of thinking is automatic and outside of our awareness. However, just as a golfer or baseball player must examine his swing in detail in order to improve it, we suspect that a leader must examine his reasons and thinking behind problem solving in order to improve his decision-making capability.

On the following three pages, you will encounter the questions described above and you will be asked to reflect on how having different goals and identifying different problems lead to different problem-solving strategies. Please answer these questions thoughtfully and thoroughly, using the digital recorders. You will have approximately 40 minutes to complete the exercise. If at any point during this exercise you have questions about what we are asking you to do, please raise your hand and someone will assist you.

Think about the first vignette you read.
It is reprinted below with the average ratings given by 59 AWC students designated as expert battalion commanders.

B3. You are a new battalion commander and one of your most important and challenging tasks is to establish the training priorities for your unit. While everything looks important and you would like to meet every possible contingency, you also realize that you do not have the time or resources to "do it all." Rate the following strategies for how effective they would be in helping you establish your priorities.

__8__ Study the brigade's training schedule.

__8__ Talk to the brigade S-2, S-3, and CSM to verify your understanding of the brigade commander's training focus.

__7__ Schedule meetings to discuss training with each of your staff members during your first week of command.

__8__ Explain your goals and your plans for the battalion very clearly to your officers and staff.

__4__ Assess the tactical and technical competence of your Soldiers individually by giving them formal and informal tests.
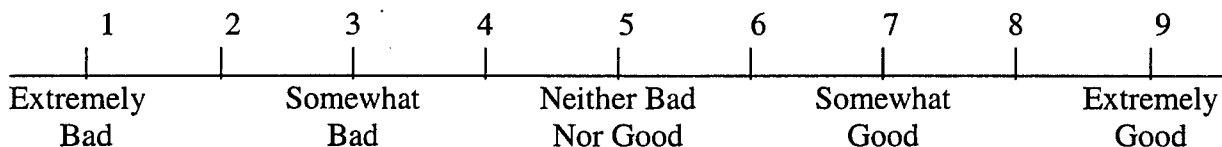
__6__ Rely on the assessments made by the previous battalion commander.

__7__ Select three to five upcoming missions (based on the brigade training plan) to focus your Soldiers' energy on.

__8__ Before doing anything, make sure you understand the commander's intent two levels up.

__8__ Soon after taking command, visit each staff section's shop and get a full briefing on their operations.

__8__ Talk to the brigade commander to determine his training priorities.

1	2	3	4	5	6	7	8	9
Extremely Bad		Somewhat Bad		Neither Bad Nor Good		Somewhat Good		Extremely Good

Note: See Part II for Overview and Instructions on Vignettes

In this vignette, my ratings differed from the AWC students' on the following options (please indicate with a check in the space provided on the left of the option):

____ Study the brigade's training schedule.   _____

____ Talk to the brigade S-2, S-3, and CSM ...   _____

____ Schedule meetings to discuss training ...   _____

___ Explain your goals and your plans ...   _____

___ Assess the tactical and technical competence ...   _____

___ Rely on the assessments made ...   _____

___ Select three to five upcoming missions ...   _____

___ Before doing anything, make sure you understand ... _____

___ Soon after taking command, visit ...   _____

___ Talk to the brigade commander ...   _____

My ratings differed from the AWC students' ratings in the following ways (Please indicate the degree of difference by writing the appropriate abbreviation to the right of the relevant response option.):

(MH) Much higher (5 or more points difference)
(H) Higher (3-4 points difference)
(SH) Slightly higher (1-2 points difference)
(SL) Slightly lower (1-2 points difference)
(L) Lower (3-4 points difference)
(ML) Much lower (5 or more points difference)

My ratings differed from the students' ratings perhaps because we had different goals in mind, and identified a different problem to be solved...

CREF-1a) What do you think is the problem that must be solved in this vignette?
CREF-1b) What goal do you intend to reach by solving it?

CREF-2a) What do you think the AWC students' goal might have been?
CREF-2b) What problem do you think they intended to solve?

Differences in problem interpretation can happen for several reasons ...

CREF-4) Describe the factors you considered when choosing your goal and determining the problem that must be solved. (e.g., doctrine, personal values, assumptions about army culture, procedures, and personnel, knowledge based on previous experiences)

CREF-5) What factors do you imagine the AWC students considered?

Think about the leadership problems in the case study you read.
(You may flip back to it to review your answers, if necessary.)
One of the questions from the case study is reprinted below with the average answer from 23 NCOs.

What COA would you take to solve the problem?

• Approach CPT Powers about coming directly to me with his concerns. Call a meeting with PSG Newell and counsel him to 'crack the whip' with the squad leaders. Take a direct role in supervising
. training exercises.

CREF-6) How does your COA differ from the one preferred by the NCOs?

CREF-7) What problem do you suppose the NCOs identified as most important in order to prefer the COA they did?

CREF-8) What factors did you consider when you chose your goal and identified the main problem in

the case study? (e.g., doctrine, personal values, assumptions about army culture, procedures, and

personnel, knowledge based on previous experiences)

CREF-9) What factors do you imagine the NCOs considered?

Think about a leadership problem that challenged you to re-examine your goals and assumptions, where your actions didn't result in the outcome you expected.

CREF-10) Briefly describe the problem situation. What was your initial goal, and the problem you had to solve to achieve it?

CREF-11) What outcome did you expect to result from your chosen COA?

CREF-11) What outcome actually occurred?

CREF-12) Describe the factors that played a role in choosing your goal and determining your problem

identification. (e.g., doctrine, personal values, assumptions about army culture, procedures, and

personnel, knowledge based on previous experiences)

CREF-13) What factors did you have to consider to change your understanding of the problem?

Appendix F 4. Sample reflection interventions: College life (experimental)

Reflection on Condition and Action: Improving Practical Problem Solving

In this brief exercise we want to show you how reflecting on your thought process when confronting a practical problem can improve your ability to find the right solution. As you well know, different people can encounter the same situation but interpret it very differently. When we respond to situations in life, much of our thinking is automatic and outside of our awareness. However, just as a golfer or baseball player examines his or her swing in detail in order to improve performance, examining thinking that underlies problem solving makes it possible to improve decision-making.

On the next few pages you will be asked to reflect on one of the college life vignettes and an experience of your own. You will be guided through a series of questions that turn your attention to how you came to understand the problems presented and how this understanding affected your decision to act. You have probably heard the phrase "think before you act". Our objective is to help you become aware of your thinking process and develop it.

In particular, we will ask you to reflect on three fundamental components of problem solving: 1) what you define as a problem; 2) the goal or outcome you hope to achieve; and 3) what actions you expect will bring about your chosen outcome.

To illustrate these points, consider the vignette below.

One evening, you come to the dining hall and attempt to join the crowd of friends you usually eat with. You get your food, you approach the table, you are about to say "Hi, guys!" and, all of a sudden, you notice that nobody greets you and nobody smiles at you. Quite on the contrary, some people are looking down while others are just staring at you.

There are several feasible interpretations of this problem. Quite often the way we interpret a problem is directly linked to a past experience that seems similar in certain respects. Some examples are as follows:

1) You may interpret the problem to be that your friends are upset with you about something you have done. Perhaps you have experienced a similar situation in high school when a few of your good friends were angry with you and chose to ignore you.

2) Alternatively this situation may remind you of a time when, for no apparent reason at all, certain friends turned against you. This experience may lead you interpret the current problem in a similar fashion.

3) A third interpretation may be that, if there is a problem, it does not necessarily involve you. Perhaps you have encountered a situation like this before when you needlessly worried about a problem that didn't involve you in the first place.

Therefore, it can be helpful to become aware of how our past experience may influence and sometimes bias how we interpret a new situation. To avoid ways that our past experience may limit our

perspective, it is important to pay attention to unique factors in the new situation and consider alternative interpretations before responding.

In the above example, a course of action that you may choose to take given your particular interpretation of a situation depends upon your goal or the outcome you wish to achieve. For example:

1) If you interpret the problem to be that you may have done something wrong, a goal or intended outcome might be to restore your friendship. This could lead to actions associated with finding out what's wrong so you can do something to straighten it out.

2) If you feel these friends are mistreating you, your goal from this perspective might be to protect yourself from being hurt. This might lead to actions associated with avoiding them.

3) If you feel that whatever is going on probably does not involve you your goal could be to avoid the problem entirely. This could lead to actions associated with pretending that there is nothing wrong and going about your own business.

Just as there are several ways to interpret problems that are reflected in the goals that you chose there are also several ways to reach those goals. After you have defined your problem, it is important to consider alternative actions before deciding on the best course of action. For example, an alternate approach to dealing with the problem of being mistreated by friends with the goal of protecting yourself could be to confront the issue and defend yourself.

We can improve our practical problem solving by recognizing what factors lead us to interpret a situation in a particular way, form our goals, and select actions to achieve them.

Now consider another vignette that you responded to earlier, which is reprinted with response options below to refresh your memory.
You have decided to apply for an internship during the upcoming break, and want to ask one of your professors for a letter of recommendation. The professor you have in mind is teaching a fairly large class, and he does not know you very well. One day you run in to him in the coffee shop, where he is sitting with what you assume are his kids

a) You decide that this is a good time to talk to him about the letter.
b) You go up and greet him, reminding him of your name and what class you are in.
c) You greet him and then start chatting with his kids.
d) You nod but do not talk to him.
e) You pretend you have not seen him. He probably does not want to deal with students outside of his workplace.
f) You ask if you can sit down with him and his kids and talk about different things.
g) You greet him and ask for an appointment with him the following day.
h) You greet him and offer to buy him and his kids coffee or sodas.

Please respond to the following questions as if you are the student in this vignette:

1a) What is your interpretation of the problem to be solved in this vignette?

1b) What is the goal or outcome you are trying to achieve?
1c) What specific course of action do you think would be most useful to achieving your goal?
1d) How would you know if this course of action was NOT effective?
1e) What factors (e.g., past experience with professors, beliefs, values, etc.) do you think influenced how you interpreted the situation and selected your goal and preferred course of action?
1f) Think about the perspective of the faculty member. How might he interpret the situation?

2a) Suggest an interpretation of the problem in this vignette that is feasible but different than yours.
2b) What factors would you have to emphasize to arrive at this interpretation?
2c) Suggest a goal that might be associated with this alternative interpretation that is feasible but different than your original goal.
2d) Suggest a course of action that you think might be effective given this new interpretation and goal.

Now, please think about a situation you encountered in either high school or college in which your actions did NOT result in the outcome that you expected and you were challenged to reexamine your assumptions, goals, and/or actions.

3a) Briefly describe the problem situation. What was your interpretation of the problem, the goal you had in mind, and the action you took?
3b) Describe the factors (e.g., assumptions, beliefs, values, past experience, etc.) that played a role in how you defined the problem, selected your goal, and/or the action you took.
3c) What outcome did you expect would result from the action that you took?
3d) What was the actual outcome?
3e) What factors did you need to reconsider to change your understanding of the problem?
3f) In light of this new understanding, what would be your goal and how would you act differently in a situation such as this?

Recognizing that the factors we consider and emphasize play an important part in determining how we interpret problem situations:

Please list at least three questions that you can ask yourself before responding to a problem situation.

Realizing that our choice of actions may be biased by assumptions, beliefs, and past experience:

Please list at least three questions that you can ask yourself before deciding on the particular course of action to take in a situation

We believe that approaching practical problems in this way can help you improve your capacity to solve problems effectively!

Appendix F 4. Sample reflection interventions: College life (control)

Please read the following article and respond to the questions provided.

<u>Living with the Opposite Sex – In your room</u>

Adapted from an article by BROCK MCCORMACK
STUDENT.COM STAFF WRITER

Imagine for a moment that you're in a dorm bathroom, just stepping out of the shower. You adjust your towel to cover the necessary parts, and as you look up, the cutie down the hall is standing inches from you. You've been turned on by your neighbor for months, and now you've finally met — in the bathroom.

Increasingly, schools are allowing male and female students to share bathrooms, suites, and in some cases, individual rooms. If you struggle to resist sexual urges on a club dance floor, or at a party, imagine sharing a room with someone of the opposite sex. Schools like Haverford College in Pennsylvania, Wesleyan University in Connecticut, and Hampshire College in Massachusetts have already adopted liberal housing policies, whereas Tufts University, located outside Boston, recently rejected the idea.

Nick D'Avella, a senior at Haverford, says, "I've been sharing a bathroom with women since my freshman year, and now I am living in an apartment with a woman. It's so not a big deal; it's ridiculous. I'm really surprised everyone outside the college (including a bunch of alums) seem to see this as an easy way for college kids to have sex or something."

Co-ed living forces everyone to be sensitive to hygiene and cleanliness issues, as the presence of a mere bathtub hairball can spark a bathroom war. Junior Thea Pratt at Wesleyan recalls how her dorm floor had both a co-ed bathroom and single-sex facilities, and boys were requested to use the urinal only in their bathroom. Some even use special signals to request privacy in the bathroom, like a secret door handle decoration or magnet.

Signs are useful for reminding suitemates to remove hair from the drain, or wipe toothpaste from the sink, although they can seem immature. Haverford senior Erin Armstrong notes that some suites at her school have had locks installed, an easy way to create a sense of privacy.

The obvious drawback of co-ed living arrangements is that some students will inevitably choose to live with a significant other, leaving residence administrators to sort out bitter break-ups. Haverford junior Rob Barry thinks, "If people are stupid enough to take advantage of this freedom by living with a significant other, then frankly it's better if they make the mistake while still in college rather than out in the real world." Living with a significant other might be great at the outset, but once an argument erupts, coming home will seem like a nightmare.

D'Avella knew some couples whose relationship soured mid-year, and says, "Some of them deal with it fine (the breakup — the actual dating isn't really a problem) and for some it's messy. You just deal with it. Kind of like if you suddenly start hating your best friend that you live with I guess...just work

something out and get through the year." Unless the residential life department ships one of you out, it's probably best to just confront the situation and work out a truce.

Wesleyan has a decidedly mature approach to its co-ed policy, essentially disclaiming responsibility for sorting out students' bad decisions. The school's residential life office says bluntly that "a male and female student can choose to live together," implying that the school really doesn't mind either way.

Anyone considering living in a co-ed room should first weigh the problems that might arise, and whether you are ready to put up with annoying bathroom or bedroom habits. Living with the opposite sex is usually great, just as long as you use some common sense.

Brock McCormack lives with two women, and he loves it.

Questions:

1) Do you think it's wise for colleges to have co-ed rooms? Why or why not?

2) What policies do you think colleges should have concerning co-ed living?

3) How would you feel about sharing a room with a co-ed?

4) How is living with the same sex different from living with the opposite sex?

5) What advantages and disadvantages do you see to having co-eds share
     bathrooms? Suites?
       Advantages:
       Disadvantages:

6) Twenty years ago, many colleges kept male and female students in separate buildings with strict visiting policies. Why do you think these rules existed at this time

7) What do you think has led to the shift in attitudes regarding co-ed living arrangements?

8) In general, how do you feel about our society's approach towards relationships between men and women as a whole?

9) How have your past experiences with roommates influenced your answers to the previous questions?